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CUSTOMER SERVICE

Telephone: (800) 328-2776
Manager, Customer Service
Kathleen C. Patto

Canada (416) 298-1177
Switzerland (41) 21 27 41 71
United Kingdom (44) 628 773 277

DATAPRO RESEARCH ☐ 1805 Underwood Blvd. ☐ Delran, NJ 08075 USA ☐ (800) 328-2776 ☐ Telex 4761231 DPRO UI.
AUSTRALIA: McGraw-Hill Book Co., 4 Barcoo St., Roseville East, NSW 2069, Australia. Telephone (61) 2 406-4288. Telex 20849. MCGRAW AA.
CANADA: Datapro Research, 330 Progress Avenue, Scarborough, Ontario M1P 2Z5. Telephone (800) 668-9308.
Telex 06525169 MCGRAWHILL TOR.
HONG KONG: Datapro Research, Suite 1133, 11th Floor, Central Building, No. 1 Pedder Street, Central, Hong Kong. Telephone (852) 5-8417835. Telex 81626 CEBC HX.
JAPAN: Nikkei Business Publications Subscription Sales Co., 1-14-6 Uchikanda, Chiyoda-ku, Tokyo 101, Japan. Telephone (81) 3 233-8081. Telex 29902 NIKKEIBPJ.
SINGAPORE: Datapro Research, Unit 05-03 Dapenso Building, 158 Cecil Street, Singapore 0106. Telephone (65) 222-5091. Telex 21912 DPRO RS.
SWITZERLAND: Datapro Research, SA, Case Postale 460, CH-1000 Lausanne 17, Switzerland. Telephone (41) 21 27 41 71. Telex 458196 DSSA CH.
SOUTH AMERICA: MIPS, R. Hungria 664 10 andar CJ. 101, 01455-Sao Paulo-SP, Brazil. Telephone 55 11 815-2315. Telex 1180907 GEMB BR.
UNITED KINGDOM: Datapro Research, McGraw-Hill House, Shoppenhangers Road, Maidenhead, Berkshire SL6 2QL England. Telephone (44) 628 773 277. Telex 848484 MCHILL G.

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COMPLETE GUIDE TO
DIAL-UP DATABASES

THIRD EDITION

by the editors of the
Datapro Directory of On-line Services

Information that leads to action
datapro

Datapro Research Corporation ☐ 1805 Underwood Blvd. ☐ Delran, NJ 08075 USA ☐ (609) 764–0100 ☐ A McGraw-Hill Company
Chicago (312) 440–2460 ☐ Dallas (214) 980–1525 ☐ Phoenix (602) 263–7831 ☐ Washington, DC (301) 589–6040

About Datapro Research Corporation

Datapro Research Corporation is the most widely accepted and respected source of up-to-date, cost-saving information about data processing and office products and services. Datapro Research Corporation was founded in 1968 to do high technology research and consulting. Datapro 70 was delivered to charter subscribers in 1970. Since then, the Datapro 70 service has come to be regarded as "the EDP buyer's bible" in thousands of subscriber sites around the world.

More services have been added. These easy-to-follow reference guides for computer users and buyers organize all that's new in electronic data processing, office automation, and communications into meaningful and manageable information. Then we add evaluations made by subscribers who rate the equipment they're currently using.

The following services make up the Datapro series:

- Datapro 70 (the EDP buyer's bible)
- Datapro Reports on Minicomputers
- Datapro Reports on Banking Automation
- Datapro Reports on Office Automation
- Datapro Directory of Software
- Datapro Reports on Retail Automation
- Datapro Reports on Data Communications
- Datapro Management of EDP Systems
- Datapro 70 International
- Datapro Reports on Word Processing
- Datapro Reports on Copiers & Duplicators
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- Datapro Management of Applications Software
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- Datapro Directory of On-line Services
- Datapro Management of Small Computer Systems
- Datapro Reports on Telecommunications
- Datapro Reports on Microcomputers
- Datapro Reports on Data Communications International
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Datapro reference services are designed to help information processing product planners and users, equipment manufacturers, software companies, consultants, financial analysts, and educators so they can better evaluate and select new hardware and software before they make a commitment.

Datapro Research Corporation, since 1968, has enjoyed over a decade of successful growth and is now the recognized leader in its field providing over 60,000 subscribers worldwide with constantly updated, comprehensive information about data processing, communications, and office automation. In addition, Datapro conducts more than 500 educational seminars yearly in major cities so information processing professionals stay on top of what is new, vital, and anticipated in data processing, communications, and office automation.

All information contained in this service is gathered from the most reliable sources available to our staff. Although the principal source of information for most reports is from manufacturer specifications and literature, these inputs are frequently clarified and augmented through telephone calls, correspondence or visits with the manufacturer or equipment users. Prior to publication, product reports are normally forwarded to the particular manufacturer for review.

Despite all of our best efforts to maintain the accuracy and timeliness of this service, the dynamic nature of the industry makes it impossible for us to guarantee the accuracy of information contained in the reports.

Complete Guide to Dial-Up Databases, Third Edition

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Introduction

Datapro's *Complete Guide to Dial-up Databases* tells you what you need to know to use publicly accessible databases and to put that information to work for you. The Who?, What?, When?, Where?, How?, How much?, and Why? of databases are described in an easy-to-understand format that gives you everything you need in one package.

Databases are warehouses of information stored on a computer. This information can be accessed by the public through the use of microcomputers or terminals via conventional phone lines. The technologies involved are described in detail in special reports included in this guide. But while it is helpful to understand the underlying technologies, it is even more important to fully understand the opportunities afforded by these databases.

Not only is information stored in great quantities on these databases, it is stored in such a way that *selective retrieval* is possible. For example, a user who wishes to obtain information on the voting record of a particular politician can ask for *only* information pertaining to that politician's voting record, without having to wade through the voting records of *all* politicians. In this way, users can greatly increase the efficiency of their research on any topic.

Further, because the information is stored in computers, frequent—even hourly—updating is possible. Therefore, the information stored in dial-up databases tends to be more current than information available from other media (like books, magazines, and newspapers).

The types of information available are almost without bound and are growing every day. Following are just a few of the topics that can be researched through databases:

- Economic information
- Airline schedules
- Demographic information of all kinds
- Research studies
- Scientific information of all kinds
- Abstracts from all varieties of publications
- Whole publications
- Legal data
- Medical data
- Political information
- Educational information
- Computer science information
- Consumer information
- Construction and building material information
- Stock market information
- Travel and entertainment information

In fact, a person involved in virtually any endeavor can find a database somewhere that contains information that will prove of value—if he or she knows where to look. This guide is designed to show you where to look, and much more. Our goal is to provide you with everything you need to know to effectively use databases. Following is a list of questions we asked ourselves when detailing the effective use of databases:

WHO provides access to these databases? Which companies allow you to dial-up their computer systems and retrieve information?

WHAT information is available? What databases are on the market today? Who produces them? Who provides access to them? What kinds of information are available? Where can I call for more information? What information does each database include? Who else uses this information?

WHEN can I access this information? How often is the information updated? How long have the producers and/or deliverers of this information been in business?

WHERE are these producers and delivers located? Can I access this information from my location?

HOW does all of this work? What do I have to do to dial-up these databases? What are the different kinds of terminals and modems available for my use in dialing-up these databases? What are the techniques involved in efficient database searching? Which microcomputers are available to facilitate searching? What software is available to facilitate searching?

HOW MUCH will all of this cost?

WHY would anyone want to dial-up databases in the first place? Why would anyone need this guide?

Asking the questions is only the first part of any problem-solving endeavor. Therefore, we have compiled over 600 pages of answers, and published them in this guide. As an aid to your research, following are descriptions of the ways in which we answered our own questions. In a way, this introduction can be thought of as a guide to Datapro's *Complete Guide to Dial-up Databases.*

WHO?

We use 2 to 19 pages to describe, in detail, the major services through which public databases can be reached.

Included are reports on:

- Bibliographic Retrieval Services (BRS)
- CompuServe, Inc.
- DIALOG Information Services, Inc.
- Data Resources, Inc. (DRI)
- I.P. Sharp Associates Limited
- Source Telecomputing Corporation (The Source)

WHAT?

Over 1400 publicly accessible databases are described in an easy-to-compare format. Each product is profiled with information like:

Database Name and Acronym—shows the name and/or acronym of the database in question.

Name, Address, Telephone Number—lists the indicated information for the organization that produces the database in question. This company gathers the information and organizes it. This company may or may not provide dial-up access to the information.

Contact Name—indicates the name you can call to get even more information about a particular company or database.

Type of Organization—refers to the organization that produces the information that is stored in the database. This organization may be a profit-making concern, or a nonprofit organization, or a government organization, etc.

Type of Database—describes the type of information to be found in this database. These types of information are categorized as follows:

REFERENCE DATABASES

- *Bibliographic* databases provide users with references to, and possibly abstracts from, published works. These published works can include books, magazines, newspapers, journals, papers, transcripts, and others.
- *Referral* databases provide users with references to, and possibly abstracts from, unpublished sources. These sources can include audiovisual materials, television or radio shows, individuals, organizations, and others.

SOURCE DATABASES

- *Numeric* databases contain the full information from surveys, and/or statistical manipulation of data. This data is often in the form of time series, with measurements represented over a period of time for a given variable.
- *Textual-Numeric* databases include both numeric and textual data referring to the same topic. These data are often in the form of data elements or fields which comprise larger records. Handbooks and dictionaries of chemical and physical properties are two common examples of this kind of database.
- *Full Text* databases include an entire published work. Usually a newspaper or magazine item, specification, court decision, law, or newsletter.

Frequency of update is usually one of the following:

- Continuously
- Daily
- Weekly
- Biweekly
- Monthly
- Quarterly
- Semiannually

Unusual updating practices are also detailed here.

Usage and Conditions details the way the database may be used and accessed. Any restrictions, like required membership in a professional organization, are also listed.

Typical pricing arrangements describes not only the charges involved, but also the way those charges are calculated. Often, access charges for databases include yearly leasing fees, on-line per-hour charges and/or membership dues.

Applications emphasis describes the principal applications area(s) in which the database is used. This information is supplied by the vendor and reviewed by our editors. Following are the standard applications areas:

1. Accounting
2. Banking and finance
3. Data communications
4. Data management and database management
5. Education
6. Engineering and Scientific
7. Facility design and management
8. Government
9. Insurance
10. Legal
11. Management Sciences
12. Manufacturing
13. Mathematics and statistics
14. Media
15. Medical and health care
16. Payroll and personnel
17. Sales and distribution

18. Transportaton
19. Others
20. Not applications sensitive

Training and installation services relates the availability of training courses and the price and conditions of those training courses. If installation services are provided, they are mentioned here.

Documentation describes the content, cost, and form of any documentation supplied to the user of the database.

Services vendor(s) lists all of the services through which the dial-up database can be accessed.

Database descriptions of these dial-up databases include information acquired from the vendor. This information is reviewed by our editors, stripped of marketing jargon, and put into objective terms that explain the features of each dial-up database.

Following are a few of the databases covered:

ABI/Inform
BIOSIS Previews
Chemical Abstracts
COMPENDEX
Computer Database
DISCLOSURE II
DORIS
Electronic Yellow Pages
ERIC
EMBASE
Flow of Funds
GeoRef
INSPEC
LEXIS
Magazine Index
Management Contents
Mediawire
MEDLINE
NEXIS
NTIS
PR Newswire
PsycINFO
Site Potential
Value Line
WESTLAW

WHEN?

Important information like hours of operation, frequency of update, and length of time in service is given for producers and deliverers of database information alike. This information can be found in the profiles of databases section, or in the on-line services companies section.

WHERE?

Name, address, phone number, and contact information is available for both producers and deliverers of database information. This helps you quickly find companies that provide the information you need.

HOW?

Included are four sections to help put this important technology in perspective and to round out your knowledge of the field.

Entitled **All About Microcomputer Communications Software**, the first section explains the importance of this technology, explains the technology itself, compares over 145 communications software products, and provides user ratings information on the top packages.

Categories of communications software detailed in this section include:

- Communications programs
- Communications programs packaged with modems
- Terminal emulation programs
- Electronic mail or bulletin board service programs

All About Personal Computers In Remote Computing details the specific uses of microcomputers in accessing on-line information and processing databases. Hardware and software topics are discussed both from the microcomputer manufacturer's point of view, and from the on-line database deliverer's point of view. As a result, you become familiar with the software and hardware both at your end of the telephone line, and at the other end of the telephone line. Knowing what you can and cannot do, and what you can and cannot expect the database company to do, is one step toward more efficient database searching.

In this section, we list over 45 microcomputer software packages that allow the user to access database information. Following are some of the packages that are profiled in this section:

- ORBIT SearchMaster from SDC Information Services
- Source Link from The Source
- DATAPATH from ADP Network Services

In this section, we also discuss downloading information from the host database to a microcomputer and the marketing arrangements that affect end-users.

Finally, we profile the communications capabilities of 66 microcomputers in a side-by-side format that allows for easy comparison.

How to Analyze Your Data Communications Needs discusses the basic components of a data communications network, including explanations of the various hardware devices and transmission facilities, and how they fit together to form a communications path. This section also describes how to go about determining whether or not you can justify data communications in your organization. Suggestions for implementing a system are presented.

All About Microcomputer Modems addresses all of the current technologies, compares over 90 microcomputer modems, and provides user rating information on the top modems.

The modems listed in this section are grouped into three categories: plug-in, standalone, and acoustic coupler. Each of these categories contain the following information:

- CERTIFICATION

- TRANSMISSION CHARACTERISTICS including speeds, modulation, synchronization, turnaround time, transmission mode, and calling mode.
- TERMINAL INTERFACES
- FEATURES including reverse channel, alternate voice/data, and integral handset.
- DIAGNOSTIC FACILITIES
- PRICE

HOW MUCH?

Pricing information is included for annual fees, connect charges, usage fees, search fees, and any other type of pricing arrangement.

WHY?

People in constant need of information, including corporate executives, financial investors, librarians, government agencies, consultants, statisticians, lawyers, scientists, and retailers, can use this guide to quickly locate sources of information. It is our hope that this guide will provide you with everything you need to make use of dial-up databases. ☐

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Electronic Mail for Microcomputers: Comparison Columns	OL70-150-301	13	3/90
An Overview of Integrated Voice/Data Terminals	OL70-200-101	8	11/90
An Overview of Value Added Networks (VANs)	OL70-400-101	12	6/90
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NEWSLETTER (OL99)

Twelve newsletters

Datapro Research Group. Delran NJ 08075 USA

Datapro

On-line Briefings

Technologies, Strategies, Services

VOL. 8, NO. 3
MARCH 1989

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The First Mass Market Database?

Information Access Company (IAC), producer of such well-known databases as *Magazine ASAP*, *Trade and Industry Index*, and *Computer Index*, is aggressively targeting that last expanse of uncharted territory—the elusive end-user market. CompuServe subscribers can now access a special version of IAC's *Computer ASAP* full-text computer database. The file, *Computer Database Plus*, provides access to two years' worth of articles from 120 computer magazines. It's available at the regular CompuServe connect charge of $12.50 per hour, plus a $24.00-per-hour surcharge.

Except for its IQuest gateway service, CompuServe previously has not offered the kind of reference databases found, for example, on DIALOG. Its roots are in the home computer market. In Computer Database Plus, IAC and CompuServe have worked together to create an easy-to-navigate version of IAC's larger Computer ASAP file.

CompuServe accommodates users unaccustomed to Computer Database Plus. For example, searchers can use familiar CompuServe commands such as "M" to get to the category's main menu. Also, when opting to see the full text of an article they are told the article's length in lines and number of bytes. A byte count is something CompuServe routinely gives for all files available for downloading.

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On-line Briefings

VICE PRESIDENT-
EDITOR IN CHIEF
J. Richard Peck

EDITORIAL STAFF

Product Manager
Algis V. Salciunas

Group Managing Editor
Lester P. Sitzes

Associate Editor
Brad Schepp

CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO
1805 Underwood Blvd.
Delran, NJ 08075
(609) 764-0100

CANADA:
Databook/McGraw-Hill
Information Systems
Company of Canada Limited,
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (416) 298-1177.

UNITED KINGDOM:
Datapro Services
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2Q1 England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

Keeping On-Line Searching a Bargain

Computer Database Plus, described in this month's lead article, is yet another on-line service targeted at end users. Its vendor, CompuServe, has nearly 500,000 subscribers, so Computer Database Plus may acquaint thousands of people with on-line searching. We suspect that many of these people, however, will experience "rate shock" when their first bills arrive. While today's fast modems and sophisticated software shorten time on-line, database searching remains expensive.

In the spirit of combating on-line expenses, here are some tips:

- Know what you are after, *before* you sign on. New *Datapro Directory of On-line Services* Advisory Board member Barbara Quint admits she sometimes goes on-line without a clear game plan. Her considerable on-line experience, however, enables her to make every second on-line productive. If her hits don't pan out, she can backtrack or fast forward with the best of them. But most of us need to plan our search strategies carefully, while *off-line*, to make our on-line time as productive as possible.
- Use the fastest modem you can afford. Usually, although an on-line vendor may charge more for 2400 bps access than for 1200 bps access, the difference is not proportionately as much. For example, a vendor may charge 50 percent more for 2400 bps access even though the user gets data at twice the rate of a 1200 bps searcher.
- Whenever possible, search when it's cheapest. Take advantage of off-peak rates and after-hours services such as DIALOG's Knowledge Index.
- Finally, use customer service. Many vendors offer toll-free numbers staffed by specialists. In some cases, the rep will even try out the search for you, saving you money and potential hardship.

Here's to happy, cost-effective searching!

Brad Schepp

Delta Buys into American's SABRE System

Competitors Delta and American Airlines have merged their Computer Reservation Systems (CRSs) to form a new, independent partnership to own and market a global CRS. American will contribute its SABRE system (the world's largest), while Delta will contribute its Datas II reservations system. Because the Delta system was much smaller than American's, Delta paid American $650 million as part of the deal. The new company will be based in the Dallas-Fort Worth, Texas area, the site of American's headquarters.

CRSs are used for airline seat, lodging, and rental car reservations and for other travel and management information services. The SABRE system, which is available via a gateway through several online systems under the name Eaasy Sabre, contains flight schedule and fare data for more than 650 airlines.

Initially, each airline will own a 50 percent in the partnership. Other companies, including travel companies and airlines not yet affiliated with a system, will be recruited to enter the partnership. As new companies join, Delta's and American's share will be equally reduced and could eventually fall to 25 percent.

One factor leading to the merger was recent government criticism of single-owner CRS systems. Indeed, other carriers have sued American claiming that its owning SABRE gave it an unfair advantage. Statistical evidence shows that travel agents affiliated with a particular reservations system make a disproportionate part of their bookings for the airline owning the system. Architectural bias in the system software confers huge marketing advantages to the sponsoring airline, according to *The Wall Street Journal.*

"We have always maintained that the criticism is unjustified," said Robert L. Crandall, chairman, president, and CEO of American. "On the other hand, we would prefer to run our business rather than run a debating contest, and we think this is a good solution for all—our customers, our employees, and our critics." The merger was also intended to strengthen the competitive position of the two companies.

There are 11 such CRSs worldwide—5 in the U.S. alone. The new company will control 43 percent of the U.S. computer reservations market, according to Delta spokesperson Jim Lundy. Roughly 17,000 of the 30,000 U.S. travel agencies are expected to use the system.

Under the antitrust laws, the merger must still pass Justice department muster. This may prove more than a formality in this case. *The Wall Street Journal* predicted that the transaction would draw "intense antitrust scrutiny."

The new Computer Reservation System would appear to have a significant advantage over United Airline's Apollo system, the second largest CRS. Last year, United Airlines sold a half interest in its system to USAir and four European carriers.

—Brad Schepp

The First Mass Market Database?

(Continued from Page 1)

Boolean operators, truncation, and even nesting are available to intensify database searches. Extensive help information is available on-line (although this is not the most cost-effective way to get this information). The user is also given the choice of retrieving just the abstract ($1.00 extra) or, if available, the full text ($1.50 extra). CompuServe always specifies when you can expect to pay more.

Should DIALOG searchers and others who access IAC computer files on other systems now switch to CompuServe? After reviewing the database, we have to conclude no. Experienced searchers can do faster, more exacting searches when going through a system such as DIALOG's.

But how about novice searchers whose research demands may not warrant a DIALOG password? Even then, Computer Database Plus may not be the right choice. DIALOG, for example, has a consumer-oriented service of its own, Knowledge Index (KI). While KI does not include Computer ASAP, it does feature other computer files such as *Business Software Database*, *Microcomputer Index*, *Microcomputer Software and Hardware Guide*, and *Computer Database.*

Computer Database, also from IAC, does not include full text, but it does offer abstracts. Also, at a flat $24 per hour with no per-hit charges or telecommunications fees, it's cheaper than Computer Database Plus. (The sign-up fees for CompuServe and Knowledge Index are comparable.) Finally, a Knowledge Index user has more than 60 other reference databases from which to choose.

On the other hand, searching Computer ASAP, which *is* available on DIALOG's main service, is much more expensive than searching Computer Database Plus. It costs $108 per hour.

Certainly, having Computer Database Plus available on CompuServe will expose on-line searching to new users. Considering the target market—a computer-savvy, but "general audience"—CompuServe and IAC are quite compatible. We'll be interested, however, in CompuServe subscriber reactions. So will CompuServe, because it would like to add other "computer-related reference materials" to its service.

Datapro Announces Reports on UNIX Systems & Software

UNIX. Multiple versions, OSF vs the AT&T camp, VAR offerings, and POSIX standards are just a few of the issues managers must face in dealing with the emergence of UNIX in business and government environments. Once relegated to engineering groups and special-purpose applications, this powerful operating system has entered the mainstream. Burgeoning UNIX interest has generated a growing market for software tools, business applications, and hardware platforms. Forward-thinking managers need information now on products and issues to develop UNIX strategies for the 1990s.

In a single volume, *Datapro Reports on UNIX Systems & Software* covers the entire spectrum. It provides in-depth reports on today's foremost software and hardware products. In addition, it delivers informed commentary on the management and standards issues confronting technology managers who must plan and build tomorrow's open systems.

Call Datapro at 1 (800) 328-2776 for more information on this unique blend of analytical product evaluations and issue-oriented reports. Or, arrange to receive a 30-day trial review, so that you can discover for yourself the valuable data and insights in Datapro's newest information service.

April 1989

VOL. 8, NO. 4

Datapro Directory of On-line Services

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In This Issue

On-line Briefings Newsletter
Quotron Systems, Inc.
Telerate, Inc.
Info Globe
Computer-Based Training
  Comparison Columns

Highlights

It's not surprising that the market for business and financial services on-line, which is the most lucrative segment of the on-line industry, is also its most competitive. In this month's issue we spotlight this sector with updated reports on two of its top companies—Quotron and Telerate.

Relative oldtimer Quotron (Report OL20-776-101) remains one of the leading suppliers of realtime financial services. Despite increased competition, more than 95,000 users (terminals) at more than 5,000 customer locations access Quotron data. Like many companies, however, Quotron is moving into new markets, which is where it finds itself playing catch-up. For example, in the fixed income market, Telerate has the largest share. Telerate, however, also faces fierce competition these days, particularly from Reuters. But, as our revised report (Page OL20-910-101) points out, all told Telerate is doing exceedingly well.

Also highlighted this month is a revised report on Info Globe (Report OL20-480-101), the Canadian on-line company that offers, among other things, electronic access to Canada's national newspaper, *The Globe and Mail.* In addition, we present a brand-new feature report describing Computer-Based Training (Report OL70-750-101). The comparison columns following the report (Page OL70-750-201) compare 300 CBT products from 46 vendors.

Finally, in this issue we formally welcome two new members to the *Datapro Directory of On-line Services* advisory board—Julie Denny of McGraw-Hill and Barbara Quint of *Database Searcher.* They join longtime board member Alfred Glossbrenner. Their biographical sketches are featured in the updated *Meet Our Advisory Board* leaf included with this month's issue.

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On-line Briefings

Technologies, Strategies, Services

VOL. 8, NO. 4
APRIL 1989

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A Shakeup at The Source

Even people who don't follow the on-line industry may have heard of CompuServe and The Source. For years, these on-line companies were synonymous with consumer-oriented on-line services, although it's been a while since they could be so easily pigeonholed. In an age when "high tech" can be intimidating, the fact that The Source and CompuServe were owned by Readers Digest and H&R Block, respectively, seemed reassuring.

During this time, CompuServe grew steadily, to 500,000 subscribers today (see "A Milestone for CompuServe," elsewhere in this newsletter). Remarkably, CompuServe achieved this growth as strong competitors entered the fray, including General Electric's GEnie service and DELPHI from General Videotex Corporation.

The Source, on the other hand, entered a period of seemingly endless stagnation. Its subscriber base stood virtually still at 70,000. Its selection of databases and other on-line services didn't change much either. It added Special Interest Groups, but never really developed them. And, while its communications services were tops, it never did feature much in the way of reference services, except for Investext reports and the ubiquitous *Academic American Encyclopedia.*

This no-growth period culminated in the sale of the company to venture capital firm Walsh, Carson, Anderson, and Stowe in mid-1987. Datapro last heard that the new owners planned to reorganize The Source along business lines to emphasize its strong suits—communications, investor services, databases and publishing, and news and information. Spokesperson Nancy Beckman told Datapro in mid-1988 that new services would follow.

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VICE PRESIDENT-
EDITOR IN CHIEF
J. Richard Peck

EDITORIAL STAFF

Product Manager
Algis V. Salciunas

Group Managing Editor
Lester P. Sitzes

Associate Editor
Brad Schepp

CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH
1805 Underwood Blvd.
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

When On-Line Searching Is a "Quest"

In our February newsletter, we heralded Dow Jones News/Retrieval's DowQuest service, and with it the arrival of natural-language searching. We said that DowQuest excites us because it lets users search databases via conversational English. Freed from the constraints of having to choose keywords, searchers can simply "tell the machine what they want." More than that, however, DowQuest uses the headlines you've marked as most relevant as the basis for subsequent searches. It assumes that business searchers may not have a clear idea of the information they need until they get a feel for "what's out there."

But does it work? We recently tried DowQuest, which is still in a testing stage. We also had someone without any search experience try it, since that's for whom the service is intended. Our novice searcher, while familiar with computers, had never searched on-line before. We placed him at DowQuest's doorstep, and let him proceed on his own.

For his first search, the searcher entered the name of financier Mike Milken, pulling up 12 articles. All proved relevant, and our searcher wanted to read them all. By the third search, he was an old hand and was telling the system to use selected headlines as the basis for subsequent searches.

One search, simply on "LANs," pulled up a piece about the Mets baseball team. Curious, we scrolled through the article page by page looking for references to local area networks. Indeed, in the last paragraph we found a reference to Dr. Alan LANs, the team doctor.

Even with artificial intelligence, computers still "think" literally. Still, and this is key, our novice searcher said he'd definitely use DowQuest for other research problems.

DowQuest is aptly named—using it is more like having an adventure than doing research. The word *quest* implies fun, not work: that's DowQuest. While we feel that users completely new to computers will need some handholding through early sessions, DowQuest is a painless entry to on-line searching.

In fact, if DowQuest doesn't get people on-line we have to wonder what will.

Brad Schepp

A Milestone for CompuServe

It doesn't seem that long ago that CompuServe sent us a press release emblazoned with a silver 250,000 to announce it had reached the quarter-million mark in subscribers. Just recently, we received a less glitzy, but actually an even more impressive release, announcing that CompuServe had reached the half-million mark in "members."

CompuServe began in 1979 with fewer than 1,000 subscribers. In announcing the present milestone, CompuServe's president and chief executive officer, Charles W. McCall, noted that while other companies have entered the industry with a bang, they often were not able to offer services of real value to personal computer users. CompuServe, on the other hand, has never strayed far from its roots. Although it's added new services over the years to broaden its market appeal, it's always stressed communications, or, to quote McCall, "people using their personal computers as windows on the world to share ideas, exchange information, and apply it to their own personal and professional lives."

McCall also attributed CompuServe's success to its "early understanding of the power and value of the personal computer, the value of providing high-quality and timely information, developing innovative products and services, and staying in touch with its members." From our own experience, we can say that using CompuServe is fun as well as informative.

Still, we haven't mentioned yet another reason for CompuServe's success. Just the other day, when upgrading to a 2400 bps modem we were surprised to see that the modem came with a CompuServe password and 15 hours of on-line time. We shouldn't have been. Perhaps more than any other on-line vendor, CompuServe has worked hard to forge marketing pacts with hardware and software vendors. When you buy a modem, there's a good chance CompuServe will make your acquaintance, as well. Also, CompuServe membership kits are available at Radio Shack stores and Waldenbooks. So, to McCall's list of reasons for CompuServe's success, we would add smart, aggressive marketing.

Finally, some controversy has brewed over just how CompuServe goes about compiling its subscriber base figures. Some would say, for example, that the tally represents passwords issued, and that usage is a completely different matter. CompuServe assures us, however, that it purges its membership rolls regularly to eliminate subscribers who have been inactive for a long time. Subscribers who show no activity after three to six months are contacted to determine their continuing interest in the on-line service.

But no matter how you look at it, 500,000 users is impressive. It certainly reflects well on the present health of the on-line industry.

A Shakeup at The Source

(Continued from Page 1)

Finally, early in 1989, they did. For example, The Source added a service enabling users of its popular CHAT feature to communicate electronically with others for a flat fee of $25 per month and $3.90 per hour (versus the standard $8.40 per hour). It also introduced a unique database, *California Connections*, which lists California-based job opportunities. What's more, The Source enhanced its electronic mail system to permit the transfer of binary files within mail messages. Via the new feature, electronic mail communications can retain control characters, underlining, and other text enhancements. Normally, in standard ASCII communications, such enhancements are bleached out. These developments (and others) amounted to the most activity we'd seen from The Source in years.

In the wake of this activity, we were surprised to learn that on February 14, 1989 The Source laid off 30 people, about a fourth of its work force. Most of the cuts, according to the *Washington Post*, came in the area of its business information services. These included *Bizdate*, a daily business tabloid. (That's too bad since our mid-1988 hands-on evaluation of The Source found *Bizdate* to be a valuable service.)

When we called The Source in mid-March to verify some details regarding this swirl of activity, the receptionist told us our contact, Nancy Beckman, "no longer works here anymore." It turns out that Beckman left the company several months prior to our call (either she was laid off and the receptionist got the date wrong, or she jumped ship just short of the tidal wave).

The Source still has many advocates. Despite its lack of depth in some areas, we like its easy-to-navigate layout and applaud its free on-line tutorial. Here's hoping The Source actually does remain "a very strong company" as its president, Michael Sears, assured the *Washington Post* it would.

Meet Our Advisory Board

We are proud to present the Advisory Board for the *Datapro Directory of On-line Services.* Our advisors are an active resource to us, providing formal review of issue contents, informal advice about the technical and editorial direction of the service, and in some cases, contribution of reports for publication. Many thanks to each of them for their continuing support.

JULIE DENNY	Currently manager of marketing and sales for *McGraw-Hill News,* McGraw-Hill recruited Ms. Denny in 1986 to bring this on-line business news service to market. Previously, she was first advertising, and then marketing manager for Dow Jones News/Retrieval. An active member of the Information Industry Association, Ms. Denny has served on many conference planning committees and is a frequent industry spokesperson. She is also the author of a number of articles in industry publications.
ALFRED GLOSSBRENNER	Mr. Glossbrenner is president of FireCrystal Communications, a business communications consulting firm based in Yardley, PA. One of the best-known authors in the computer communications field, Mr. Glossbrenner is the author of *The Complete Handbook of Personal Computer Communications* and *How to Look It Up Online.* Several tutorials by Mr. Glossbrenner appear in the *Datapro Directory of On-line Services,* including *An Overview of On-line Databases* (Report OL10-100-101) and *How to Look It Up On-line* (Report OL10-200-101).
BARBARA QUINT	Editor of *Database Searcher,* Barbara Quint's name is a familiar one to members of the on-line industry. Ms. Quint has more than 17 years experience as an on-line searcher on some 27 different search services. She served as head of reference services for the RAND Corporation library for 19 years. Ms. Quint has also authored numerous articles, book chapters, and reports on database searching and the information field. Currently, in addition to her duties as editor of *Database Searcher,* she is an information broker and consultant with Quint and Associates.

May 1989

VOL. 8, NO. 5

Datapro Directory of On-line Services

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On-line Briefings Newsletter
On-line Databases J-R (Update)
Company Profiles J-R (Update)
CompuServe, Inc.
Data-Star
Dow Jones News/Retrieval
Interactive Market Systems (IMS)

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Highlights

This month's issue brings an update of the company and database profiles, in the J-R section. This section features over 200 companies and over 600 databases. In addition to updating the existing profiles, we've also added some new ones. These include the *Japan Free Press*, which allows users to access information straight from Japan's mass media—information that may not be accessible in English anywhere else. Another new database, *New Technology Week*, includes analyses of technological breakthroughs in such areas as superconnectivity and magnetic levitation transport.

Also of note this month is a revised report on CompuServe. CompuServe recently reached an important milestone: it hit the 500,000 subscriber mark. It's the first on-line service to accomplish this. Despite its success, however, CompuServe has no time to bask in its achievement. It faces ever-increasing competition from General Electric's on-line service, GEnie. Read all about it in Report OL20-178-101.

You'll also find an updated report on Dow Jones News/Retrieval. Dow Jones offers on-line services primarily of interest to the corporate user. Its new service, DowQuest, is interesting in that it allows a user to search the company's text databases using everyday language, instead of formal search commands. See Report OL20-376-101 for more details.

Finally, this issue contains an update on Data-Star. While well known in Europe, Data-Star is now gaining recognition in the U.S. as a source of information on business, engineering, and science. See Report OL20-348-101 for an in-depth look. ☐

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June 1989

VOL. 8, NO. 6

Datapro Directory of On-line Services

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In This Issue

On-line Briefings Newsletter
AgriData Resources, Inc.
GE Information Services
General Videotex Corporation (GVC)
  Delphi
QL Systems Limited
Questel, Inc.

Highlights

For those of you who missed May's National Online Meeting, the highlight of this month's issue will be our newsletter, *On-line Briefings*. In it, you'll find the show's highlights and our analysis of the major industry trends.

Other highlights of this month's issue include five revised general services reports. "GE Information Services" (Report OL20-436-101) describes the company which first commercialized remote computing services but which is largely out of that business now and concentrating on other things. For example, Electronic Data Interchange (EDI) services are receiving much of its attention. Also, its GEnie on-line information service now ranks number two in the industry, one step behind the undisputed leader, CompuServe.

"Questel Inc." (Report OL20-770-101) has added several new files to boost its stature as a leading vendor of patent, chemical, and sci-tech files. It's also added a new service, Markush DARC, a chemical database system for retrieving chemical structures from patent documents.

"General Videotex Corporation (GVC) Delphi" (Report OL20-438-101), a competitor of CompuServe and GEnie, now has 50,000 subscribers. It has added another regional offshoot—Delphi/Kansas City. Delphi is also forging alliances with several of the Bell Operating Companies that are establishing information gateways.

Other reports you'll want to review include "AgriData Resources, Inc." (Report OL20-018-101), the preeminent supplier of agricultural data on-line; and "QL Systems Limited" (Report OL20-764-101), a Canadian on-line vendor that has added a substantial number of files to its repertoire.

Finally, you'll find addenda to the database and company profiles for the S-Z sections of the Directory.

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- The H. W. Wilson Company—Wilsonline
- National Library of Medicine (NLM)
- Standard & Poor's Compustat Services, Inc.
- An Overview of Hypertext and Hypermedia

Highlights

This month's *On-line Briefings* includes our thoughts on NEXIS News Plus, Mead Data Central's (MDC's) new front-end software package for searching its NEXIS news service. MDC is hoping that this new software package will entice end users to tap NEXIS, the premier source of on-line full-text information. Also included is an article on "dirty data"—typos, wrong information, and other errors that are increasingly finding their way into on-line databases.

Aside from the newsletter, we have a full complement of updated general services reports this month. Topping the list is an updated report on the National Library of Medicine (Report OL20-674-101), the leading vendor/producer of biomedical databases. The NLM has added an important file—AIDSLINE—and introduced a new version of its Grateful Med front-end software package.

The H.W. Wilson Company (Report OL20-450-101) now sees its CD-ROM products as contributing more revenue to the company than its on-line databases. Our revised report describes what's new on both fronts: the company's on-line databases (available through its Wilsonline on-line services) and its CD-ROM products, marketed under the name WilsonDisc.

Executive Telecom System, Inc.'s Human Resource Information Network is the only on-line service catering to personnel professionals. In the last year or so the company has added new databases, upgraded its processing center, and added a fax service. See our revised report (Report OL20-410-101) for the details.

Undoubtedly, you've been hearing a lot about hypermedia and hypertext. For details on software packages that make use of this exciting information retrieval method, see our new feature report, An Overview of Hypertext and Hypermedia (Report OL70-650-101).

Finally, we've added new company and database profiles to the A-C section of the Directory.

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Datapro

On-line Briefings

Technologies, Strategies, Services

VOL. 8, NO. 7
JULY 1989

Editorial View 2

NEXIS News Plus:
Accessibility at a Price 3

When Dirty Data Dances on Your Screen

People tend to believe that "if it's in print, it must be true" (barring perhaps publications such as the *National Enquirer*). The same holds true for information that comes from on-line databases, only more so. People feel that if a computer "generated" the information, it has to be correct. Unfortunately, this can be a dangerous assumption.

Obviously, on-line databases are only as accurate as the sources from which they are derived. Complicating matters, additional errors can creep into on-line data during the information's passage from hard copy to electronic form.

Information integrity is already worrying some on-line database users. *The Information Advisor*, a new newsletter dedicated to data accuracy, recently asked its readers what topics they wanted future issues to cover. Topping the list of responses was "evaluating on-line data." In subsequent research, including discussions with database users and producers, the newsletter's editor, Robert Berkman, discovered errors in on-line data are rampant enough to stir widespread concern.

Four types of errors exist. The first type is typographical errors. These create problems when they result in odd citations that appropriate searches will not retrieve. They can also cause problems when they involve numbers. For example, a missing or additional zero in a market research report can convey the wrong message about an industry's prospects. While spelling checkers should eliminate most spelling errors, apparently not all vendors use them.

(Continued on Page 4)

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Associate Editor
Brad Schepp

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CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH
1805 Underwood Blvd.
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

When Computers Slow You Down

In describing some of the features of NEXIS News Plus, the new software package available for searching NEXIS, Mead Data Central Vice President Richard C. Anderson, Jr. shed some light on what's keeping end users from going on-line. "While no one denies the importance of information in today's world, few people have the stamina to pursue it," Anderson said.

Bingo! Therein lies the reason why many end users still don't use databases. Despite the front ends, the menus, and the gateways, on-line databases remain arcane. Assuming you've mastered communications parameters, networks, passwords, and everything else that goes with using a communications program, the biggest hurdle is still ahead of you. Those 4,500 databases are spread over hundreds of on-line services. Even the names of the files don't necessarily give a clue as to their contents (consider *ABI Inform* and *PTS Promt*).

In recent months, a new generation of front ends has debuted that makes searching easier than ever. In the world of software, however, help and ease of use typically come at the cost of speed. Nowhere is this more evident than in NEXIS News Plus, an amazing information tool that, unfortunately, some users may find too slow.

In fact, the program's slowness is its biggest failing. Managers want information, yes, but they want it quickly. They figure that air computer should be capable of delivering facts as quickly as it crunches numbers. We're far from that now.

To its credit, NEXIS News Plus should make NEXIS users out of a lot of people who otherwise would not use this incredible database resource.

Brad Schepp

NEXIS News Plus: Accessibility at a Price

Mead Data Central's (MDC's) success as an on-line vendor is mostly due to LEXIS, its on-line service for the legal profession. NEXIS, its news service, has never done as well. This is unfortunate because NEXIS contains the sources everyone is familiar with, in greater abundance than any other on-line service. *Forbes*, *Newsweek*, *Time*, and *Fortune* are all here, as are *MacWeek*, *InfoWorld*, and *Scientific American*. What's more, these files go back further on NEXIS than they do on many other systems. For example, its loading of the *Washington Post* dates back to 1977.

While NEXIS has never lacked sources, accessibility and expense have kept its user ranks relatively small. NEXIS has been chipping away at the accessibility problem for years (e.g., you no longer need a dedicated terminal; anyone with a personal computer can access NEXIS). NEXIS' new front-end package, *NEXIS News Plus*, reportedly makes NEXIS even more accessible, and cheaper, too.

MDC views the News Plus rollout as a way to reintroduce NEXIS. A flashy media campaign is backing it, the details of which were still "embargoed" at the time of this writing. The campaign will reportedly include a giveaway of some sort (software?). This campaign may well be under way by the time you read this.

News Plus costs a reasonable $50. Its target market is end users, the market that NEXIS has always courted. "End users," however, encompass a lot of ground. Previously, most of NEXIS' customers were journalists and public relations professionals. MDC is now after much bigger game—the lucrative business market—a market it no longer wants to concede to competitors such as DIALOG and Dow Jones/News Retrieval. "We'd like for CEOs to get on this and use it," spokesperson Suzanne Quigley said.

Does News Plus do what it sets out to do? Yes and no. It certainly makes getting at NEXIS' information easier. News Plus breaks down NEXIS' huge database clearly and cleverly, so you can zero in on the sources most likely to have the information you want. Also, you can scout out sources and formulate (and verify) a search strategy while off-line. With the on-line clock running at a $20-per-hour clip, that's a real savings. The program also lets you save search strategies for later use and do things in background mode.

Its major drawback is its slowness (see *Editorial View*, elsewhere in this newsletter). MDC recommends that you use News Plus on an AT or 386-class machine, and so do we. MDC also suggests users go in at 2400 bps. (The program comes on eight diskettes, so installation takes more than a couple of minutes.) As the NEXIS technical staff admitted, there is a lot of "I/O" (Input/Output) associated with using the software, which eats up a lot of time, and downloading to disk seems to take a lot longer than it did before. The program also takes up more than two megabytes of memory, placing it in the memory hog category.

NEXIS News Plus is not for power users of NEXIS. Its slowness will frustrate such people. Fortunately, MDC's original LEXIS/NEXIS Communications Software remains available. But end users, such as managers, will find News Plus provides easy entrée to NEXIS. The 45-minute telephone training, for example, provided free with purchase, is a valuable benefit.

We look forward to new versions of News Plus that perhaps trade off some of its extensive off-line help for greater speed. Regardless, NEXIS has come far since the days of its dedicated terminals. While we are not yet to the science fiction "instant-answer machines," NEXIS News Plus certainly brings them closer.

—Brad Schepp

Dirty Data

(Continued from Page 1)

Another problem is database coverage. A database may not cover either what it purports to or what you expect it will based on your interpretation of the vendor's marketing materials. Coverage varies with the vendor hosting the file. Increasing competition in the on-line industry has caused some vendors to make misleading claims about their files' coverage.

Next is the quality of indexing. Indexing is an imprecise science. Yet, to perform exacting searches, you need descriptors or other items that rely heavily on the quality and the consistency of the indexing. If the indexing is inconsistent, users may be misled into thinking that information they want is not there. Good indexing can be a major problem with full-text files, where information is sometimes dumped into a database quickly with scant thought given to indexing.

The fourth problem is errors in the original resource that carry over into the electronic version. The *Los Angeles Times'* field reporters now use portable fax machines for submitting stories instead of laptops and modems, even though modem delivery feeds the information directly into the paper's electronic publishing system. Why? When "modeming" information, noise on the phone line can cause a blip that changes a crucial number in a story. The *Los Angeles Times* is sensitive to this, but how many other information producers are?

Obviously, you will not have the time to verify all the data that comes across your desk. About all you can do is be aware and discerning, recognizing that errors are certainly possible. In the case of important research, for example, data on which a merger or acquisition hinges, numbers should be verified. Even "factual" information such as a company's earnings for a given year can vary from database to database.

As more information becomes available electronically, the issue of database quality will grow in parallel. Articles such as the one in *The Information Advisor*, and Barbara Quint's regular *Caveat Searcher* column in the journal *Database Searcher*, perform a useful service by drawing attention to this issue.

As a service to subscribers of the *Datapro Directory of On-line Services, The Information Advisor* will send a free copy of its April 1989 newsletter, which focuses on the reliability of on-line information, to anyone requesting it. Write to:

Robert Berkman, Editor
The Information Advisor
The Winters Group
14 Franklin Street, Suite 920
Rochester, New York 14604

September 1989

VOL. 8, NO. 9

1989
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Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
DRI/McGraw-Hill
I.P. Sharp Associates Limited
ORBIT Search Service

Highlights

This month's *On-line Briefings* newsletter covers the biggest story to hit the on-line industry since Knight-Ridder's purchase of DIALOG: the unshackling of AT&T. Following a seven-year ban, Judge Greene recently ruled that AT&T can offer electronic information services of its own. AT&T has wanted to enter the market since 1982, and now there is nothing standing in its way. The rumors are flying as to what AT&T might do. This month's newsletter covers the hoopla. It also reintroduces a popular feature, *Database Potpourri*, which will keep you abreast of new databases in between updates to the Directory's database sections.

Aside from the newsletter, we've included updates to several of our general services reports. There's an updated report on "DRI/McGraw-Hill" (Report OL20-345-101), a McGraw-Hill subsidiary. DRI/McGraw-Hill provides econometric forecasting and associated services to analysts in industry, finance, and government.

We've also revised "I.P. Sharp Associates Limited" (A Reuter Company), a leading on-line database company specializing in finance, economics, energy, and aviation. I.P. Sharp has developed a number of financial software products, including the *Global Limits Control System*, the market leader in global limits systems for foreign exchange and money trading. See our revised report (Report OL20-530-101) for more details.

"ORBIT Search Service" (Report OL20-720-101), a division of the Maxwell Online, Inc. is a recognized leader in on-line information services. Second only to DIALOG, ORBIT specializes in on-line information in the areas of patents, chemistry, engineering, and electronics.

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October 1989

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Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
CompuServe, Inc.
DIALOG Information Services, Inc.
The General Electric Network for Information Exchange (GEnie)

Highlights

This month's *Online Briefings* covers the recent Information Industry trade show held September 10-13 at the New York Hilton. Also, the "Database Potpourri" section includes announcements of new databases and services from the industry's leading vendors.

This month also brings updates to three of our general services reports. We've updated our CompuServe report to report on CompuServe's buyout of The Source. CompuServe has begun announcing which of The Source's services it will feature. For all the details, see Report OL20-178-101.

You'll also find an updated report on GEnie (GE Network for Information Exchange). In less than four years, this consumer-oriented videotex service has attracted more than 160,000 subscribers to gain the number two spot in its market. To stay competitive with CompuServe, GEnie has cut its prime time rates for 300, 1200, and 2400 baud access to only $18 per hour. GEnie now offers more than 100 on-line databases in various areas. See Report OL20-436-201 for more details.

Finally, we update our information on DIALOG Information Services, Incorporated. Since January 1989, DIALOG has added more than 15 on-line databases, ranging from chemical engineering to insider stock trading. It also added several new training files to its ONTAP Database. To maintain its position as the industry's leading database vendor, DIALOG has increased its CD-ROM offerings and also added the full text of several more newspapers. For further information on DIALOG, see Report OL20-366-101.

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November 1989

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Datapro Directory of On-line Services

In This Issue

- On-line Briefings Newsletter
- BRS Information Technologies
- Mead Data Central
- Company and Database Addendum (Section J-R)
- All About Asynchronous Microcomputer Software

Highlights

As described in this month's *On-line Briefings*, the biggest name in video games, Nintendo, is now hoping to duplicate this success in the on-line services market. The company recently announced it will team with Boston's Fidelity Investments to create an on-line financial service providing portfolio management, realtime trading of securities and mutual funds, and access to financial market information.

Aside from the newsletter, we've included several updates to our general services and feature reports. "BRS Information Technologies" (Report OL20-106-101) is an operating division of Maxwell Online Inc. Since it became part of the Maxwell team, it now can compete with industry-leader DIALOG. BRS is a formidable vendor of on-line databases, offering its 60,000 subscribers access to more than 150 databases. Primary markets for its services are libraries, medical and pharmaceutical firms, and physicians.

"Mead Data Central" (Report OL20-630-101), best known for its LEXIS on-line legal information service, also offers its subscribers, NEXIS, a full-text information service containing information from more than 650 business, financial, technical, and news sources.

This issue also brings an addendum to the company and database profile sections (J-R). Some of the highlighted vendors and the databases they offer are McGraw-Hill News, a subsidiary of McGraw-Hill, Inc., offering a database by the same name, *McGraw-Hill News*; Technical Data Global Markets Group, which offers its newest databases—*MortgageData, MoneyData,* and *PriceData*; and Executive Telecom System, Inc., which introduced *Personnel Practices Survey Database, Managing End User Computing For Users With Disabilities*, and *Military in Transition.*

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Telephone: (800) 328-2776
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Canada (416) 298-1177
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January 1990

VOL. 9, NO. 1

Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
European Space Agency-
  Information Retrieval Service
  (ESA-IRS)
The WEFA Group
West Publishing Company

Highlights

This month's *On-line Briefings* highlights three important companies' activities for the past year. Activity in the on-line industry in 1989 included acquisitions, plenty of new on-line databases, and new CD-ROM developments. Read all about how DIALOG, BRS, and NewsNet made 1989 such a successful year.

This month also brings updates to three of our general services reports. We've updated our report on the European Space Agency-Information Retrieval Service (ESA-IRS) to report on ESA's new pricing strategy. Included in the report is an updated table on all of ESA's databases and how the new pricing policy affects each database. See Report OL20-405-101 for all the details.

We've also updated our report on The WEFA Group (Report OL20-970-101).

WEFA still continues to offer a wide selection of on-line economic, financial, and demographic information services. The On-Line Database section of the report describes the selection that The WEFA Group has to offer. Finally, we've included an update of our West Publishing Company report. West Publishing Company offers a computer-assisted legal research service, WESTLAW. Numerous publication databases are added monthly. Refer to Report OL20-980-101 to review the materials recently added to the WESTLAW on-line service.

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On-line Briefings

Technologies, Strategies, Services

VOL. 9, NO. 1
JANUARY 1990

Editorial View 2

Database Potpourri 3

1989: The Year in Review

With the conclusion of another year—and the '80s—we can look back and say 1989 was an industrious year for the on-line industry. Acquisitions; CD-ROM developments; new system features/enhancements; and, of course, new on-line databases all contributed to making 1989 another sensational year.

All of the vendors discussed in this newsletter have enhanced their services. All have contributed something significant to the industry, helping them toward their goal of eventual leadership in their specialty.

DIALOG, a Knight-Ridder, Inc. subsidiary, had a strong showing in 1989. It provided products and services tailored to its users' needs and specifications. Here's some of the highlights that made 1989 another successful year for DIALOG.

System Features—the *Profile Feature* was added in May 1989. It allows users to store SET commands that customize DIALOG to their needs. The *SORT* command was also changed in May to increase the maximum number of items in a set that can be sorted. In July, DIALOG introduced the *SET SELECT* command. This allows control of the display of intermediate search results that appear in response to users' *SELECT* commands. In September, a special feature was added to enable keeping track of on-line costs. If telecommunications difficulties ever cause you to be disconnected from DIALOG in the middle of a search, a cost estimate message will be displayed when you log on again.

(Continued on Page 4)

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Telephone (800) 328-2776

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600 Delran Parkway
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(609) 764-0100

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Telephone (800) 668-9308.

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Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

A Look at Prodigy

Prodigy, an interactive personal service from IBM and Sears, allows you to view the latest news and sports, buy and sell stocks, learn from educational features, shop, and much more. Basically, it's for the home computer enthusiast. Its price is attractive: $9.95-per-month flat rate.

I took a stab at discovering what Prodigy was like. The service claims in its start-up kit booklet that "getting around is easy on Prodigy." Well, they were right. I found the documentation very helpful in learning how to load the software and in explaining the basic commands you need to know before actually logging on to the service.

Well, okay. I read the booklet from beginning to end and was ready to start. I logged in and hit the RETURN key for the headline news of the day and was able to view a timely news story about a mass murder in Canada.

Using the JUMP command, I moved on to another area . . . travel. The system provided me with 11 options. I enjoy flying American Airlines (AA) and decided to view some fare listings from *EAASY SABRE*. The only problem I encountered was that I had to wade through many screens of text just to enter the service. I can understand why nonmembers would have to do this, but I'm already a member! A solution to this problem would be to have separate menus for those who already belong and for those who want to join.

Prodigy includes ads on the bottom quarter of each new screen of nonadvertiser information. These advertisements, along with the entire system, contain eye-pleasing graphics.

In sum, Sears and IBM produced a well-rounded product. It offers something for everyone in a household, whether one is interested in learning about computers, checking the weather to plan a vacation, or outsmarting everyone else by beating the hustle-bustle of Christmas shopping.

Although I've only explored one small part of the Prodigy service, it certainly seems to possess a wealth of information available at your fingertips. I applaud the creators of Prodigy and hope to be seeing more from the service.

Melissa S. Cymbor

Database Potpourri

Data-Star announced that its *TRADSTAT* database now has on-line trade statistics from Austria, Finland, and Portugal. Its coverage has increased to 13 countries, and coverage of South American trade is enhanced. *TRADSTAT* now covers 85 percent of world trade. A new file, *Eventline*, covers worldwide trade show events. The cost for accessing this database is $97.00 per connect hour, $0.93 per on-line citation, $1.00 per off-line citation, $5.33 per SDI, and $1.00 for each citation taken from the SDI, and there are no print charges.

Free fields are also available. *Health News Daily*—contains the full text of that publication, which covers the health care industry: pharmaceuticals and pharmacy, medical devices and diagnostics, biomedical research, cosmetics, health policy, and more. Articles are written daily and transmitted immediately to a special subfile. (They appear on-line several days or a week before they are available in print.)

The cost to access this database is $130 per connect hour, nondiscount hours; $110 per connect hour, 1 p.m. to 1 a.m., discount hours; $2.00, each citation; $2.10, off-line print; $4.67, SDI; and $2.10 for each citation taken from an SDI.

For further information, contact D-S-Marketing, Inc., Suite 110, 485 Devon Park Drive, Wayne, Pennsylvania 19087. Telephone (800) 221-7754 or (215) 687-6777.

Executive Telecom System, Inc.—added three directories to its Human Resources Information Network (HRIN): *Training and Development Organizations Directory*, *Videos for Business and Training*, and *Newsletters in Print*.

The *Training and Development Organizations Directory* includes over 2,000 training firms, offering thousands of seminars and workshops across the country.

Videos for Business and Training includes thousands of video training programs on over 200 different subject areas. It covers a full range of topics, from working in the oil industry to writing business letters.

Newsletters in Print provides detailed entries of over 10,000 sources of authoritative information on a wide range of high-interest topics. Seven broad categories made up of 31 specific subjects are included in this database.

For further details, contact the producer, Gale Research, Inc., Penobscot Building, Detroit, Michigan 48226. Telephone (800) 877-GALE. Also, you may contact The Human Resource Information Network, Executive Telecom System, Inc., 9585 Valparaiso Court, Indianapolis, Indiana 46268. Telephone (800) 421-8884 or (317) 872-2045.

—Melissa S. Cymbor

Review

(Continued from Page 1)

On-Line Documentation—additional on-line documentation was added in September, and a new on-line HELP command was introduced. Options to the HELP command were also added, including descriptions of the output format options for each database on DIALOG. The last system feature that was added in 1989 was DIALOG HOMEBASE, a database designed for DIALOG searchers that provides menu-assisted access to DIALOG's online documentation.

DIALOG Alert Service—formerly the Selective Dissemination of Information SDI service—was updated and enhanced in September. DIALOG Alert Service helps you stay updated and informed about topics of importance to you and your clients.

New Databases—32 were added in 1989 ranging from chemical hazards data to business information. Seven new ONTAP files were also added in 1989. As the year ended, DIALOG now offers more than 200 million individual records.

Services and Products—*Knowledge Index* and *DIALOG Classmate* were expanded to all of the countries that offer regular DIALOG services.

DIALMAIL—in February, the WITHDRAW command was added to allow bulletin board users to withdraw their names from any bulletin board to which they are a member. Also, this feature may be used by bulletin board sponsors who wish to remove their bulletin board once it has served its purpose. In May, DIALOG added the ability to receive image output from the databases *TRADEMARKSCAN—Federal* and *HEILBRON* through DIALMAIL. Finally, several new in-box settings were added to give users more flexibility in managing personal messages.

DIALOG Business Connection—this menu-assisted front end to key business and financial information was added as a new option to DIALOG's main service last May. This option also includes the latest business news from *McGraw-Hill News.*

For further information, contact DIALOG's Marketing Department at (800) 334-2564.

BRS Information Technologies—BRS was acquired by Macmillan Inc. in January and was later folded into Maxwell Online. In October, BRS moved from Latham, New York to the Official Airline Guide (OAG) facility outside Chicago, Illinois. Once there, BRS joined the ORBIT Search Service (another division of Maxwell Online, Inc.) at this facility.

BRS added eight new databases and four new on-line medical journals. New system features on BRS/Search Service included LINK, SAVE, and SORT. On Colleague and MENUS, the LINK feature was added. *Colleague Encore*, an SDI or current awareness service, was added to Colleague. Colleague Screens Simplified was enhanced to simplify the Colleague Main Menu, and the SORT function was added to all three of the services.

Enhancements were made to the *MEDLINE* database, including monthly updates; the ability to run SDIs once or twice a month; a full-text (FT) market that indicates full-text availability of the journal in CCML; and two new BRS "search only" age descriptors that make it easier to restrict a search to age 18 and under and age 19 and over.

NewsNet, last year, added more than 70 new publications in areas such as aerospace and aviation, manufacturing, electronics and computers, research and development, and telecommunications. Last June, NewsNet released new user documentation for the first time in five years. This rewritten user documentation incorporates features requested by users: detailed examples and explanations, shoulder notes, and marked sections.

Business Wire—was added to NewsNet's roster of newswires. Continuously updated, it includes corporate press releases from the nation's most important corporations.

PR Newswire—formerly updated hourly, was enhanced to deliver articles continuously. The five wires from United Press International were made readable, scannable, and searchable. The articles from these wires are accessible in full text instantly and can be searched by keyword phrase within an hour of release.

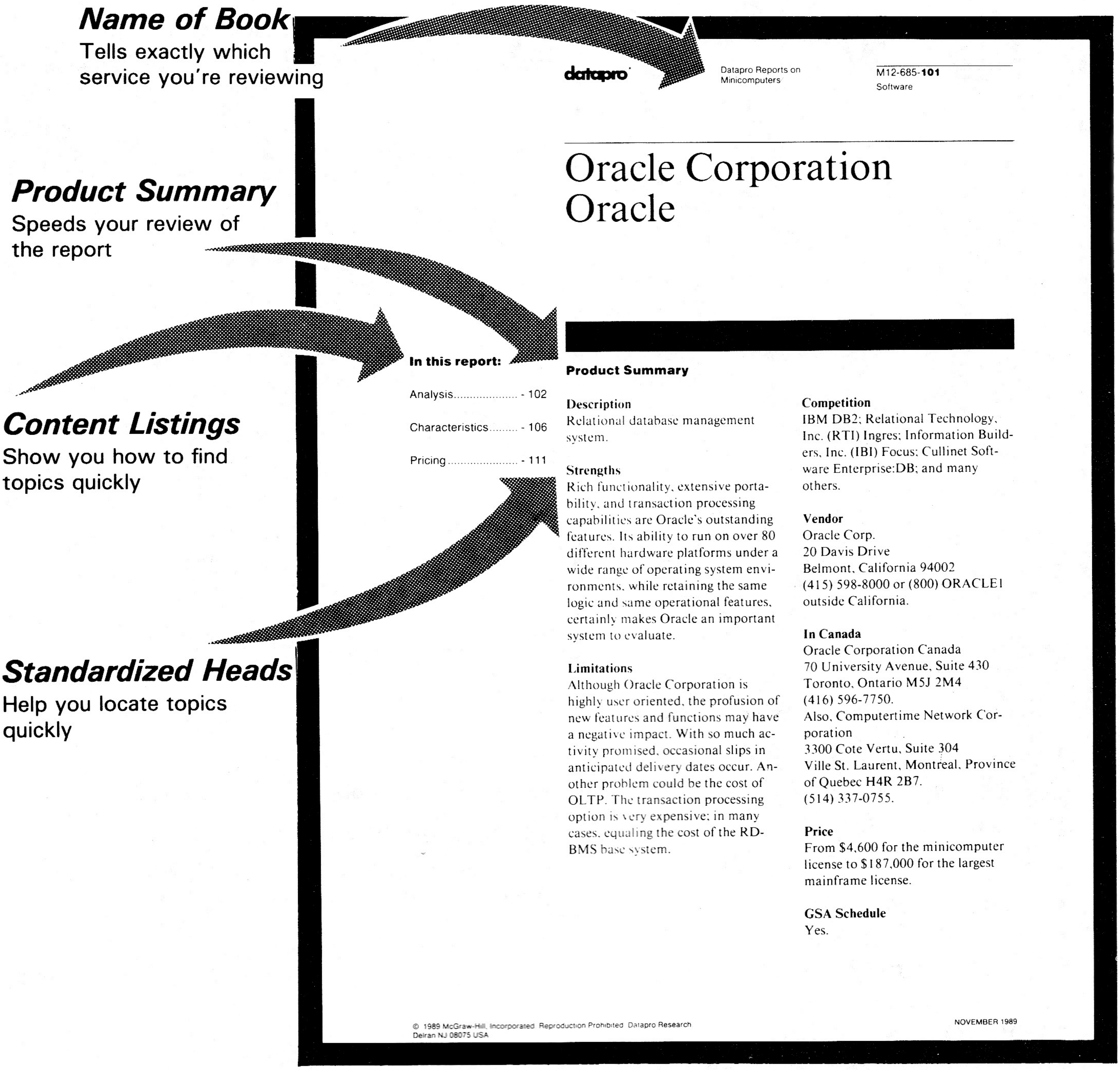
TRW Business Profiles was enhanced to allow retrieval of multiple reports for a single report fee. Improved paging capabilities were also introduced, along with executive summaries of larger reports.

For more details, contact a marketing representative at NewsNet, 945 Haverford Road, Bryn Mawr, Pennsylvania 19010. Telephone (215) 527-8030.

WELCOME to Datapro's new report formats . . .

From now on, Datapro reports will have a ***new*** look—an easier-to-read format with larger typefaces and a more open design. We've redesigned the first page to summarize and highlight key information.

New features and benefits of product reports:



Name of Book
Tells exactly which service you're reviewing

Product Summary
Speeds your review of the report

Content Listings
Show you how to find topics quickly

Standardized Heads
Help you locate topics quickly

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Datapro Reports on Minicomputers

M12-685-**101**
Software

Oracle Corporation
Oracle

In this report:

Analysis ... - 102
Characteristics ... - 106
Pricing ... - 111

Product Summary

Description
Relational database management system.

Strengths
Rich functionality, extensive portability, and transaction processing capabilities are Oracle's outstanding features. Its ability to run on over 80 different hardware platforms under a wide range of operating system environments, while retaining the same logic and same operational features, certainly makes Oracle an important system to evaluate.

Limitations
Although Oracle Corporation is highly user oriented, the profusion of new features and functions may have a negative impact. With so much activity promised, occasional slips in anticipated delivery dates occur. Another problem could be the cost of OLTP. The transaction processing option is very expensive; in many cases, equaling the cost of the RDBMS base system.

Competition
IBM DB2; Relational Technology, Inc. (RTI) Ingres; Information Builders, Inc. (IBI) Focus; Cullinet Software Enterprise:DB; and many others.

Vendor
Oracle Corp.
20 Davis Drive
Belmont, California 94002
(415) 598-8000 or (800) ORACLE1 outside California.

In Canada
Oracle Corporation Canada
70 University Avenue, Suite 430
Toronto, Ontario M5J 2M4
(416) 596-7750.
Also, Computertime Network Corporation
3300 Cote Vertu, Suite 304
Ville St. Laurent, Montreal, Province of Quebec H4R 2B7.
(514) 337-0755.

Price
From $4,600 for the minicomputer license to $187,000 for the largest mainframe license.

GSA Schedule
Yes.

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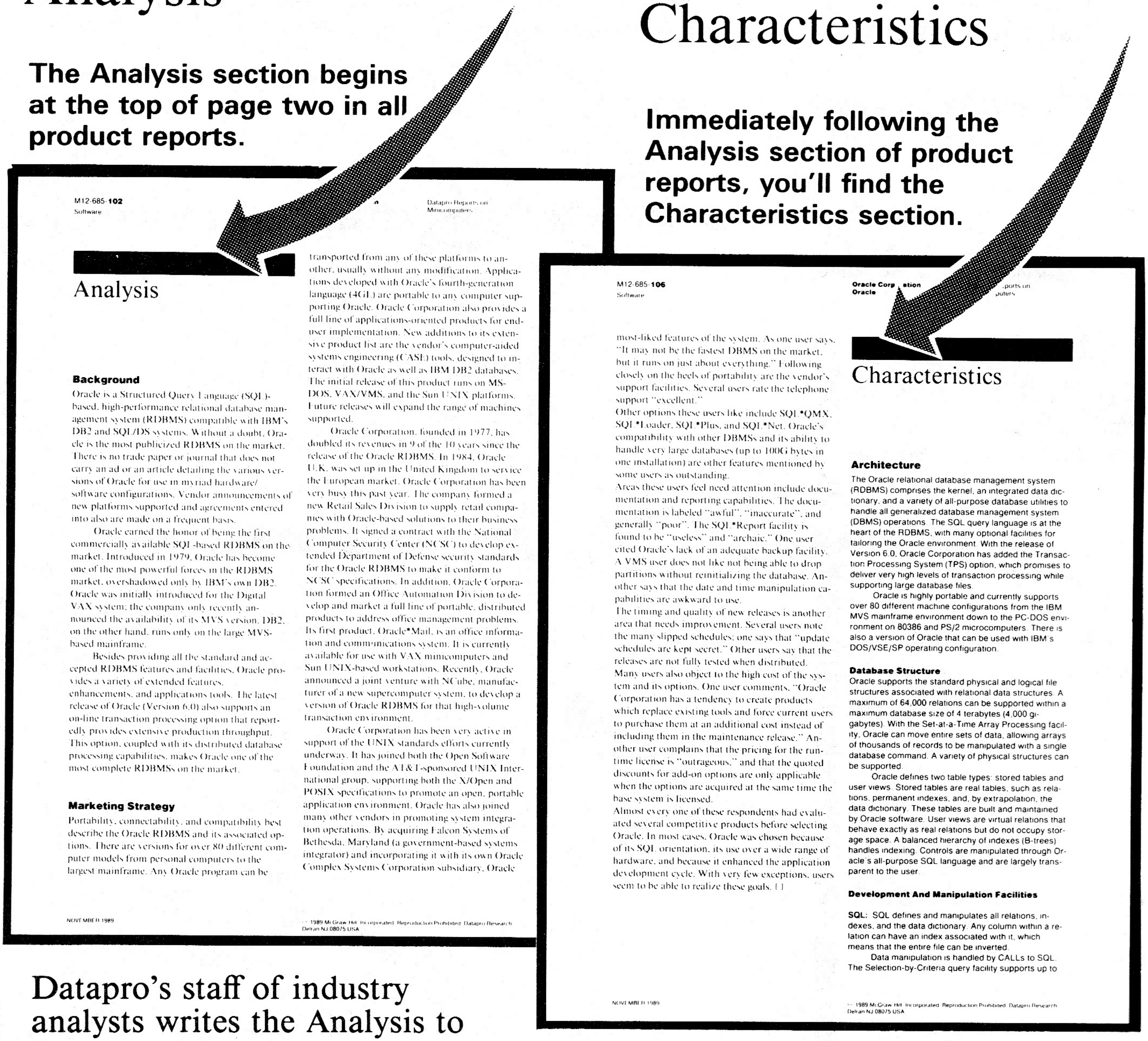
Product Reports

Analysis

The Analysis section begins at the top of page two in all product reports.

Characteristics

Immediately following the Analysis section of product reports, you'll find the Characteristics section.



M12-685-**102**
Software

Datapro Reports on
Minicomputers

Analysis

Background

Oracle is a Structured Query Language (SQL)-based, high-performance relational database management system (RDBMS) compatible with IBM's DB2 and SQL/DS systems. Without a doubt, Oracle is the most publicized RDBMS on the market. There is no trade paper or journal that does not carry an ad or an article detailing the various versions of Oracle for use in myriad hardware/software configurations. Vendor announcements of new platforms supported and agreements entered into also are made on a frequent basis.

Oracle earned the honor of being the first commercially available SQL-based RDBMS on the market. Introduced in 1979, Oracle has become one of the most powerful forces in the RDBMS market, overshadowed only by IBM's own DB2. Oracle was initially introduced for the Digital VAX system; the company only recently announced the availability of its MVS version. DB2, on the other hand, runs only on the large MVS-based mainframe.

Besides providing all the standard and accepted RDBMS features and facilities, Oracle provides a variety of extended features, enhancements, and applications tools. The latest release of Oracle (Version 6.0) also supports an on-line transaction processing option that reportedly provides extensive production throughput. This option, coupled with its distributed database processing capabilities, makes Oracle one of the most complete RDBMSs on the market.

Marketing Strategy

Portability, connectability, and compatibility best describe the Oracle RDBMS and its associated options. There are versions for over 80 different computer models from personal computers to the largest mainframe. Any Oracle program can be transported from any of these platforms to another, usually without any modification. Applications developed with Oracle's fourth-generation language (4GL) are portable to any computer supporting Oracle. Oracle Corporation also provides a full line of applications-oriented products for end-user implementation. New additions to its extensive product list are the vendor's computer-aided systems engineering (CASE) tools, designed to interact with Oracle as well as IBM DB2 databases. The initial release of this product runs on MS-DOS, VAX/VMS, and the Sun UNIX platforms. Future releases will expand the range of machines supported.

Oracle Corporation, founded in 1977, has doubled its revenues in 9 of the 10 years since the release of the Oracle RDBMS. In 1984, Oracle U.K. was set up in the United Kingdom to service the European market. Oracle Corporation has been very busy this past year. The company formed a new Retail Sales Division to supply retail companies with Oracle-based solutions to their business problems. It signed a contract with the National Computer Security Center (NCSC) to develop extended Department of Defense security standards for the Oracle RDBMS to make it conform to NCSC specifications. In addition, Oracle Corporation formed an Office Automation Division to develop and market a full line of portable, distributed products to address office management problems. Its first product, Oracle*Mail, is an office information and communications system. It is currently available for use with VAX minicomputers and Sun UNIX-based workstations. Recently, Oracle announced a joint venture with NCube, manufacturer of a new supercomputer system, to develop a version of Oracle RDBMS for that high-volume transaction environment.

Oracle Corporation has been very active in support of the UNIX standards efforts currently underway. It has joined both the Open Software Foundation and the AT&T-sponsored UNIX International group, supporting both the X/Open and POSIX specifications to promote an open, portable application environment. Oracle has also joined many other vendors in promoting system integration operations. By acquiring Falcon Systems of Bethesda, Maryland (a government-based systems integrator) and incorporating it with its own Oracle Complex Systems Corporation subsidiary, Oracle

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M12-685-**106**
Software

Oracle Corp ation
Oracle

ports on
puters

most-liked features of the system. As one user says, "It may not be the fastest DBMS on the market, but it runs on just about everything." Following closely on the heels of portability are the vendor's support facilities. Several users rate the telephone support "excellent."

Other options these users like include SQL*QMX, SQL*Loader, SQL*Plus, and SQL*Net. Oracle's compatibility with other DBMSs and its ability to handle very large databases (up to 100G bytes in one installation) are other features mentioned by some users as outstanding.

Areas these users feel need attention include documentation and reporting capabilities. The documentation is labeled "awful", "inaccurate", and generally "poor". The SQL*Report facility is found to be "useless" and "archaic." One user cited Oracle's lack of an adequate backup facility. A VMS user does not like not being able to drop partitions without reinitializing the database. Another says that the date and time manipulation capabilities are awkward to use.

The timing and quality of new releases is another area that needs improvement. Several users note the many slipped schedules; one says that "update schedules are kept secret." Other users say that the releases are not fully tested when distributed.

Many users also object to the high cost of the system and its options. One user comments, "Oracle Corporation has a tendency to create products which replace existing tools and force current users to purchase them at an additional cost instead of including them in the maintenance release." Another user complains that the pricing for the run-time license is "outrageous," and that the quoted discounts for add-on options are only applicable when the options are acquired at the same time the base system is licensed.

Almost every one of these respondents had evaluated several competitive products before selecting Oracle. In most cases, Oracle was chosen because of its SQL orientation, its use over a wide range of hardware, and because it enhanced the application development cycle. With very few exceptions, users seem to be able to realize these goals. □

Characteristics

Architecture

The Oracle relational database management system (RDBMS) comprises the kernel, an integrated data dictionary, and a variety of all-purpose database utilities to handle all generalized database management system (DBMS) operations. The SQL query language is at the heart of the RDBMS, with many optional facilities for tailoring the Oracle environment. With the release of Version 6.0, Oracle Corporation has added the Transaction Processing System (TPS) option, which promises to deliver very high levels of transaction processing while supporting large database files.

Oracle is highly portable and currently supports over 80 different machine configurations from the IBM MVS mainframe environment down to the PC-DOS environment on 80386 and PS/2 microcomputers. There is also a version of Oracle that can be used with IBM's DOS/VSE/SP operating configuration.

Database Structure

Oracle supports the standard physical and logical file structures associated with relational data structures. A maximum of 64,000 relations can be supported within a maximum database size of 4 terabytes (4,000 gigabytes). With the Set-at-a-Time Array Processing facility, Oracle can move entire sets of data, allowing arrays of thousands of records to be manipulated with a single database command. A variety of physical structures can be supported.

Oracle defines two table types: stored tables and user views. Stored tables are real tables, such as relations, permanent indexes, and, by extrapolation, the data dictionary. These tables are built and maintained by Oracle software. User views are virtual relations that behave exactly as real relations but do not occupy storage space. A balanced hierarchy of indexes (B-trees) handles indexing. Controls are manipulated through Oracle's all-purpose SQL language and are largely transparent to the user.

Development And Manipulation Facilities

SQL: SQL defines and manipulates all relations, indexes, and the data dictionary. Any column within a relation can have an index associated with it, which means that the entire file can be inverted.

Data manipulation is handled by CALLs to SQL. The Selection-by-Criteria query facility supports up to

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Datapro's staff of industry analysts writes the Analysis to focus on the most important concerns of managers, such as:

- Product Strategy
- User Opinion
- Company Profile
- Decision Points
- Competitive Position

This includes a detailed listing of the product's specifications, technical descriptions, and pricing.

Product Overview Report

In addition, the ***product overview reports*** are divided into three sections to allow you to quickly find ***market, technology,*** and ***comparison column*** information. Here are sample title pages.

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Datapro Reports on Minicomputers

M14-600-101
Communications

Micro-to-Mini Links: Market Overview

Synopsis

Editor's Note
This report discusses recent trends in the micro-to-mini link market. The technologies found in micro-to-mini links are described in the Technology Overview (Report M14-600-121). The Comparison Columns (Report M14-600-151) provide the key characteristics and pricing for micro-to-mini link products.

Today's Marketplace
Almost any corporation with PCs understands the need to connect to a minicomputer/host. Although their PCs may have been installed to perform standalone operations, such as word processing, graphics programs, and spreadsheet analysis, a need soon developed to access and manipulate data traditionally under the minicomputer's control. All currently noncommunicating PCs are potential candidates for PC-to-minicomputer links, and purchasing policies for PCs, micros, mainframes, and any intermediaries between them need to consider the possibility of interconnection. New more cost-effective and powerful multitasking PCs will make downloading minicomputer applications more feasible. Recognizing the place of PC-to-minicomputer products, larger corporations are developing

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Datapro Reports on Minicomputers

M14-600-121
Communications

Micro-to-Mini Links: Technology Overview

In this report:

Analysis .... -122
Terminal Emulation .... -127
Operational Issues .... -130
Data Security .... -132

Synopsis

Editor's Note
This report discusses the basic tech nology of micro-to-mini link products. Recent conditions and trends the marketplace are described in th Market Overview (Report M14-600 101). The Comparison Columns (R port M14-600-151) contain tables that provide the key characteristics and pricing for micro-to-mini links

The Basic Technology
PC-to-minicomputer communications can be looked upon as merely substituting PCs for dumb termina PCs were not designed for this role however, and, therefore, have char acteristics that must be accommodated through the technology and through careful user planning. In o der to decide which PC-to-minicomputer link is best for a particular situation, users must gai a basic understanding of the differ ences between minicomputers and PCs and the elements that any com munications system must employ.

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Datapro Reports on Minicomputers

M14-600-151
Communications

Micro-to-Mini-Link: Comparison Columns

In this report:

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Vendors .... -152
Comparison Columns .... -157

Synopsis

Editor's Note
This report contains comparison columns that provide the key characteristics and pricing for micro-to-mini link products. Recent trends in the market for these technologies are covered in the Market Overview (Report M14-600-101). A separate Technology Overview (Report M14-600-121) describes the technologies found in micro-to-mini links.

Comparison Columns
The comparison columns that follow the vendor list summarize the characteristics of 301 commercially available PC-to-host products from 93 vendors. The products all allow PCs to communicate with a host mainframe or minicomputer. The information contained in these columns was supplied by the vendors.

Datapro sent requests for information to about 150 North American vendors known or believed to be in the PC-to-host link business. We believe these columns represent a comprehensive overview of the current micro-to-mini link market. *The absence of a company or a product from this report indicates the company failed to respond to repeated requests for information, the product is no longer actively marketed, or the company is no longer in business.*

There are many types of products currently marketed as PC-to-host links. Datapro has tried to be as flexible as possible when including products in the comparison column section of this report. Some products do not correspond well to the specifications listed in the columns, however. We (and the respective vendors) have tried to fit these products into the Datapro comparison column format so as to provide the reader with the most useful information possible. For additional product information or to clarify an entry in a column, we urge the reader to contact the appropriate vendor.

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Comparison columns and tables within these reports are redesigned in an easier-to-read horizontal format.

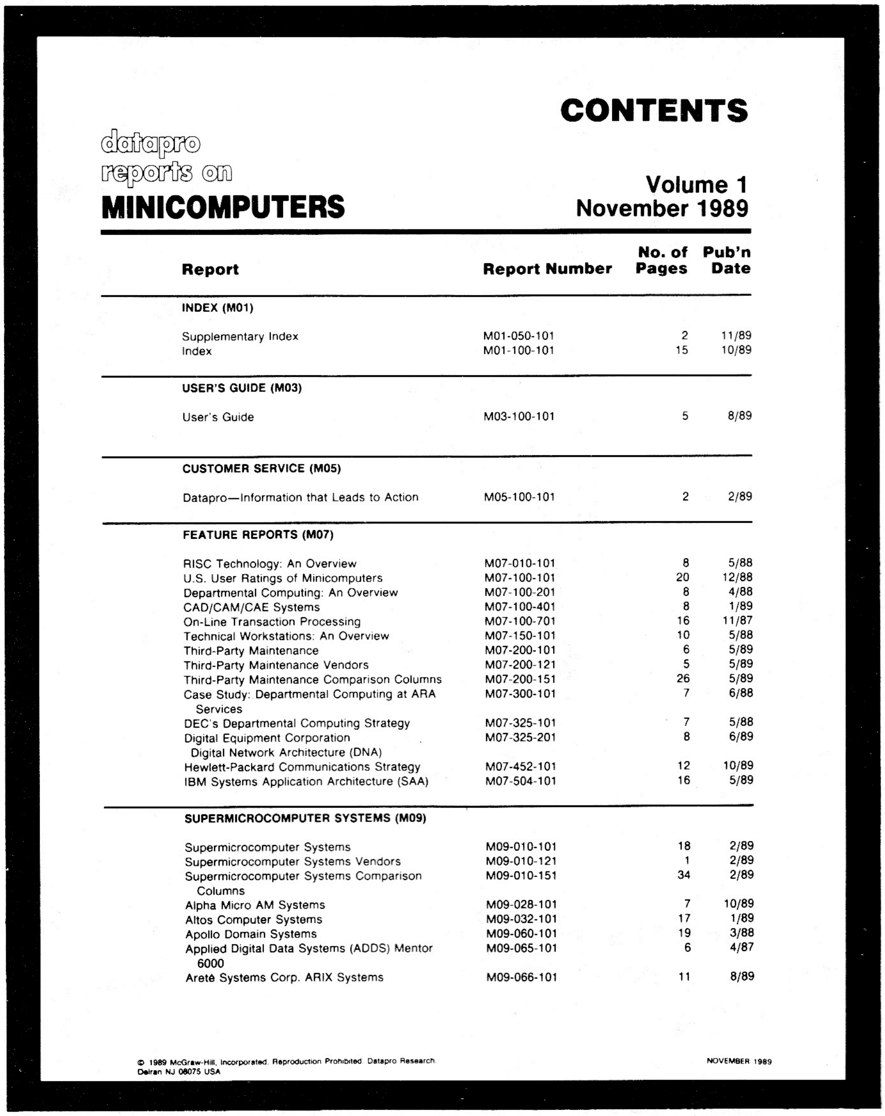
Table of Contents

These are samples of Datapro's "new look." You'll find all of this month's reports—and future reports—in the new format. Eventually, ***all*** reports reports will have the new look, but for now, your service includes both the new and earlier format. Consult the User's Guide for information about the previous format. The Table of Contents shows the exact location of the User's Guide in your service.

If you have any comments about the new formats, please write to Datapro Research, Editorial Operations, 600 Delran Parkway, Delran, NJ 08075; or call Customer Service at (609) 764-0100.

NEW

The new Table of Contents has larger easier-to-read text so that you can quickly find the report you need.



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February 1990

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Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
An Overview of On-line Databases
How to Look it Up Online
Using On-Line Databases for Competitive Analysis

Highlights

This month's *On-line Briefings* newsletter features an article on Mead Data Central's newest innovation, *Real-Time Stock Quotes*, available on-line through Mead's LEXIS and NEXIS service. In addition to the New York and American stock exchanges, quotes are available from all U.S. regional stock exchanges, Canadian stock exchanges, and NASDAQ and NASDAQ/National Market System, with no time delay. Read all about how Mead has enhanced its already vast services.

Also this month we've updated three of our tutorials. The learning tools contained in the tutorial section include primers (or basic reports) about on-line searching. The section is designed for both novice and more experienced searchers: The reports build on one another, advancing from the general to the specific. The first tutorial, "An Overview of On-line Databases," shows you how and why on-line databases are created. You'll learn the differences among various types of databases and how to decide when going on-line makes sense and when it does not. Read all about this and much more in the tutorial section (OL10-100-101). "How to Look it Up Online" (OL10-200-101) describes the best way to use a vendor's customer service staff for search assistance, how to plan an on-line search strategy, how to comprehend the elements that make up an on-line citation, and also how to formulate a search strategy to your best advantage. Finally, the third tutorial, "Using On-Line Databases for Competitive Analysis," teaches you to assess the value of on-line databases for performing competitive analysis research, to pinpoint databases that may be valuable to your research, and how to use those databases effectively.

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On-line Briefings

Technologies, Strategies, Services

VOL. 9, NO. 2
FEBRUARY 1990

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On-Line Stock Quotes Debut on MDC

Mead Data Central, Inc. (MDC), provider of the world's leading full-text, computer-assisted electronic information services, LEXIS and NEXIS, took a huge step recently by giving its subscribers access to stock quotations.

So what's novel about having stock quotations go on-line since it has been done before? Well, MDC, along with its subsidiary, Canadian financial services company Dataline, Inc., has provided a gateway in which stock quotes can be viewed with absolutely no time delay. Realtime quotes can be requested for equities, bonds, mutual funds, and money market funds. Not only are quotes available from the New York Stock Exchange but also from all U.S. regional stock exchanges, all Canadian stock exchanges, NASDAQ, and the NASDAQ/National Market System. You also have additional access to current Dow Jones Averages, S&P Indices, and market summaries from the New York and American stock exchanges.

LEXIS and NEXIS subscribers can access this valuable information through a menu-driven service that's part of MDC's *QUOTE* library on the LEXIS Financial Information service. Three main features are available from the *QUOTE* library. Subscribers can view a realtime quote on a company through the menu's *QUOTE FINDER* option; request a realtime update on an item in their own "electronic portfolio" with the *QUOTE SAVER* option; or may check a market indicator, such as the New York Stock Exchange market summary.

The *QUOTE SAVER* option is probably the most fascinating feature of Mead's new stock quote service.

(Continued on Page 4)

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CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH
600 Delran Parkway
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
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Editorial View

CIM: CompuServe at Its Best

CompuServe recently debuted a new software package, CompuServe Information Manager (CIM), expressly designed to make using its service simple and productive. Reminiscent of Prodigy, it includes pull-down windows and memo-like templates for creating electronic messages. It also includes a "file cabinet" feature that makes organizing electronic mail a breeze. But most importantly, CIM makes it much easier to learn and navigate the system.

A lengthy learning curve was a barrier for CompuServe users, because the system includes so much and so many different kinds of information. After all, just getting on-line entails enough of a learning curve. Once the new user has jumped that hurdle, the vendor should make things as easy as possible rather than present another horrendous learning curve.

Information Manager doesn't eliminate the CompuServe learning curve, but it certainly shortens it. For me, it also made getting around the system so much easier that I found I was soon exploring areas of the service I had never looked at before Naturally that benefited me, but it also benefited CompuServe since my on-line sessions grew longer. (Note: At $29.95, plus a $15.00 usage credit, CompuServe is practically giving CIM away.)

CIM is not without its glitches Although CompuServe's spokespeople say it isn't so, it seems to take longer to do things if you ar using CIM. Also, it occasionally throws you off-line for no apparent reason, or gets "frozen," requiring the user to reboot.

Still, CIM breaks new ground. I encourage present CompuServe users to try it, and new CompuServe users to use it to learn the system.

Brad Schepp

Database Potpourri

Information Access Company (IAC) recently announced that Data Research Associates, Inc. held its first public showing of selected IAC databases for on-line access via Data Research's Public Access Catalog System. Data Research users will be able to access the IAC databases through the same terminals and protocol now used to search the library's book catalog.

The first database offered was *General Periodicals Index* (Academic and Public Library editions each providing indexes to more than 1,000 magazines and journals widely used in undergraduate studies and for general reference). Also included are other IAC databases, offered in CD-ROM and on-line.

For more information on this database, contact Veronica Kane at (415) 364-5662, or Information Access Company, 362 Lakeside Drive, Foster City, CA 94404. Telephone (415) 378-5000.

GE Information Services recently added two more services on its GEnie system; one to its menu service and the other on the RoundTable service.

Computer-Assisted Learning Center (CALC) was added to GEnie's menu service and offers a variety of on-line educational services. Based in Rochester, NY, CALC opened its first network campus in 1986 and is now among the leaders in on-line classroom instruction, with four national campuses. CALC also provides on-line, supplemental educational services for its students, such as academic and career counseling, the CALC Student Union for on-line chats among students, and a large selection of on-line quizzes for fun.

A *Unix RoundTable* is now available on GEnie, joining the other services on its menu of Personal Computing RoundTables. The *Unix RoundTable* is a forum for first-time users of AT&T's UNIX Operating System to help them learn its ins and outs and how to program in the UNIX environment. There is also a separate section for experienced users. Subjects to be discussed include, but are not limited to, Hardware Platforms, UNIX Dialects, UNIX Shells and Scripts, Applications, Communications, Calendar of Events, Resources, Training, Security, and Graphical User Interfaces. Other UNIX-like operating systems (i.e., the Xenix operating system) will also be covered in this RoundTable.

For further information about the GEnie service and the on-line sign-up procedure, call (800) 638-9636, or contact GE Information Services, Attn: Steve Haracznak in Press Relations, 401 North Washington Street, Rockville, MD 20850. Telephone (301) 340-4494.

Predicasts added seven titles to the full-text *Newsletter Database.* With these additions, more than 250 newsletters are now available. The additions are as follows:

- *VideoNews International*—monitors the video industry on a global basis, including growth of new delivery systems such as HDTV and broadcast TV, cable TV, and home video. It also tracks industry change for buyers and sellers of programs.
- *Gas Daily*—includes reports on the U.S. natural gas industry, with coverage of prices, production, capacity, transportation, contracts, exploration, leases, legislation, and regulatory issues.
- *World Food & Drink Report*—covers important events in the worldwide food and drink industry, covering industry issues, regulatory action, market trends, and company activities including new product announcements, new packaging, and interviews with industry leaders.
- *Israel Business*—reviews Israeli business and economic development, with articles and briefs on new products, major domestic and foreign contracts

and ventures, company performance, and government programs and legislation as they relate to business.

- *Innovation*—covers industrial R&D and science-based industry in Israel, including potential applications of research results, joint ventures, and codevelopment programs with non-Israeli companies.
- *411 Newsletter*—includes practical cost-cutting and management information for telecommunications management professionals. The database covers long-distance and local services, buying phone systems, regulatory trends, users groups, new equipment and services, and career issues. It also includes an annual salary survey and an annual PBX survey.
- *Diagnostics Business Matters*—provides business intelligence on companies involved in making and marketing medical diagnostic products, along with information on the latest trends and events in research, development, markets, product introduction, joint ventures, and merger and acquisition activity.

For more information, contact Predicasts, 11001 Cedar Avenue, Cleveland, OH 44106. Telephone (800) 321-6388 in the continental U.S. and Canada or (216) 795-3000 in Ohio.

STN International added nine new databases to its on-line network: *Chemical Industry Notes*, *Engineered Materials Abstracts*, *Ceramic Abstracts*, the *Inorganic Crystal Structure Data* file of numeric crystallographic data, and the *HODOC* numeric file on properties and spectra of organic compounds; the *NUMERIGUIDE* directory of numeric files on STN; the *Pharmaprojects* listing of pharmaceutical products under development; the *TIBKAT* library catalog file of special holdings in science and technology; and *LBEILSTEIN*, a learning file for the *BEILSTEIN* database.

For more detailed information on these databases and others, contact STN International, 2540 Olentangy River Road, P.O. Box 3012, Columbus, OH 43210. Telephone (614) 447-3600.

NewsNet added four new services. All four newsletters are published by Alert Publishing, Inc.

- *Research Alert*—provides reports that analyze the life-styles, shopping habits, attitudes, and demographic statistics of consumers in the U.S. It is published biweekly. More than 700 research studies are covered each year.
- *Affluent Markets Alert*—covers the spending habits and preferences of the affluent.
- *Minority Markets Alert*—analyzes the trends and patterns important to marketers aiming at Hispanic, black, and Asian American consumers, minority groups that may soon take up a majority of the population in the United States.
- *Youth Markets Alert*—reveals developments in the teen and young adult groups, giving marketers a competitive edge with these fickle but powerful consumers.

For more information on these four newsletters, contact either Alert Publishing, Inc., 37-06 30th Avenue, Long Island City, NY 11103. Telephone (718) 626-3356, or NewsNet, 945 Haverford Road, Bryn Mawr, PA 19010. Telephone (215) 527-8030.

West Publishing Company recently added another service to its WESTLAW system.

- *West's Legal Directory*—enables the subscriber to identify lawyers and law firms by specialty areas, clients, professional affiliations, and a variety of other characteristics. The customers can use this on-line directory to research opposing counsel, refer clients to other attorneys, find current name and address information, or simply advertise their own qualifications.

Contact Dorothy Molstad at West Publishing Company, 50 W. Kellogg Boulevard, P.O. Box 64526, St. Paul, MN 55164-0526. Telephone (612) 228-2475.

—Melissa S. Cymbor

On-Line Stock Quotes

(Continued from Page 1)

The customer can build an "electronic portfolio" of up to 50 stocks, showing for each stock how many shares are held. After the quotes are saved in the portfolio, you can request an update for quotes one by one or all at once. The information included with each quote includes the last trade, net change, volume, bid/ask price, open, dividend, yield, earnings, P/E ratio, and the yearly high and low.

In addition to MDC's normal connect and telecommunications charges, ($22/hour connect time and $13/hour telecommunications), each quote requested through the *QUOTE FINDER* or *QUOTE SAVER* menus costs $1. Possibly MDC's next step in this area would be to let its subscribers buy and sell their stocks online, now that they have access to realtime stock quotes.

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SUBJECT INDEX (OL07)			
Subject Index	OL07-100-101	62	12/89
TUTORIALS (OL10)			
An Overview of On-line Databases	OL10-100-101	8	2/90
Assessing the Cost-Effectiveness of On-line Databases	OL10-150-101	5	2/89
How to Look It Up Online	OL10-200-101	21	2/90
Using On-Line Databases for Current Awareness	OL10-300-101	7	7/88
Accessing Books, Magazines, and Newspapers On-line	OL10-350-101	11	3/89
Using On-line Databases for Competitive Analysis	OL10-400-101	9	2/90
Using On-line Databases for Market Research	OL10-450-101	7	5/88
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April 1990

VOL. 9, NO. 4

Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
Company Profiles D-I
On-line Databases D-I

Highlights

If you need the most current information about on-line databases, or the companies that produce or market them, then April's issue is for you. We've updated the D-I sections of database and company profiles, contacting hundreds of companies in the process. But we've done more than simply revise existing information. We've also added new company and database profiles.

April's *On-line Briefings* newsletter includes an article that should interest anyone who goes on-line. It centers on 2400-bps modems, which have now become the standard for business communications. Especially important are the rating's provided by the National Software Testing Laboratory (NSTL). NSTL provides a full range of software and hardware testing services.

Next month's issue includes an important update to our tutorial section of reports. It also features a report on working with information brokers, written by one of the leading authorities in the field.

Delran NJ 08075 USA

Datapro Directory of On-line Services (ISSN 0730-7071) is published monthly by Datapro Research, 600 Delran Parkway, Delran, NJ 08075. Annual U.S. rate for new subscriptions $576, renewal subscriptions $568. In Canada, new subscriptions CDN $908, renewal subscriptions CDN $728. Second-Class Postage paid at Riverside, NJ. POSTMASTER: Send address changes to Datapro Directory of On-line Services, 600 Delran Parkway, Delran, NJ 08075.

Datapro

On-line Briefings

Technologies, Strategies, Services

VOL. 9, NO. 4
APRIL 1990

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NSTL Rates 2400 bps Modems

It seems just a short time ago that acoustic coupler modems transmitting at a mere 300 bps were the rage. Then, 1200 bps modems moved in. Now, few would deny that 2400 bps modems are the standard for business communications. While 9600 bps modems will soon be more commonly used (see March 1990's *On-line Briefings*), 2400 bps modems for the foreseeable future will remain more versatile and cost-effective. With most on-line vendors charging a minimal or even no price differential between 1200 and 2400 bps access, and the prices of the modems themselves comparable, there is really little reason not to move up to 2400 access.

PC Digest, a publication from Datapro's National Software Testing Laboratories (NSTL), recently reported the results of NSTL's evaluation of 2400 bps modems. The results are somewhat surprising. The NSTL reviewers carefully considered the modems' AT command set compatibility, ease of configuration and installation, and handling of impaired line conditions.

Because all the modems operate at the same speed, error correction and data compression protocols are the most important factors in selecting a 2400 bps modem. These protocols determine a modem's capability to communicate with other manufacturers' modems using error correction and data compression to provide maximum throughput.

The findings showed that modems vary considerably in features, performance, usability, and compatibility. Also, as you might expect, they also vary quite widely in price. There are more than 125 manufacturers of 2400 bps modems, and prices range from under $100 to over $1,000. Top vendor Hayes may be right when it suggests that modems have yet to become a commodity item, much like personal computers.

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Datapro
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CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH
600 Delran Parkway
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

Soviet Thaw Prompts Information Flow

Soviet and American information professionals are getting together to capitalize on a big marketing opportunity: Americans are hungry for information about the Soviet Union. While Soviet mathematical and health sciences journals have been heavily translated, there is much more that needs to be brought to light. In fact, "There is a dearth of information about the Soviet Union," says Paul Zurkowski, who for 20 years headed the U.S.-based Information Industry Association (IIA).

In a move to tap into this information, in October 1989 the First East-West Online Information Meeting was held in Moscow. The 3,000 Soviet attendees "stripped bare" all the exhibitor information in a little more than a day, said Zurkowski, who served as a session chairman. The International Center for Scientific and Technical Information, the meeting's Soviet sponsor, was joined by Learned Information, Ltd., of Oxford, England which cosponsored the event. Well aware of the great worldwide interest in their country, the Soviets were there to forge deals with American and European database vendors.

Since the meeting, there has been a lot of discussion between American database producers and Soviet information providers. Also, an East/West Information Consortium has formed, to work toward making Eastern European information available to the West. No products have resulted yet, but according to Zurkowski, some are in the works.

Zurkowski, now president of the Maryland-based start-up, Ventures in Information, has published a report called "The Soviet Precinct," listing the 200+ Soviet information providers at the Online Information Meeting, from various associations to the Soviet Academy of Science Agencies. For more information, contact Ventures in Information, 8027 Ellingston Drive, Chevy Chase, MD 20815. Telephone (301) 565-5029.

Zurkowski could not discuss these ‘in-the-works" products, but he did share a recent conversation he had with a major Soviet telephone company executive. The Soviet telco is looking to get into videotex and wanted to tap Zurkowski's expertise in the area. Perhaps a Soviet version of France's famous Minitel services is in the offing. Stranger things have happened recently.

Brad Schepp

Datapro Consultant Now Available

Imagine you want to buy a spreadsheet program for your Macintosh computer. You turn on your Mac and immediately summon comparison columns detailing all the available alternatives. You then choose the products you want to compare in more detail, or perhaps you ask the system to find spreadsheet programs that meet your exact needs. With another click of the mouse, the voice of a Datapro expert takes you on a tour of the key strengths and weaknesses of a given program, complete with a real-time look at the program in action. When you are finished, you have a total feel for a product—how it works, what it looks like, how it compares to others, and its cost.

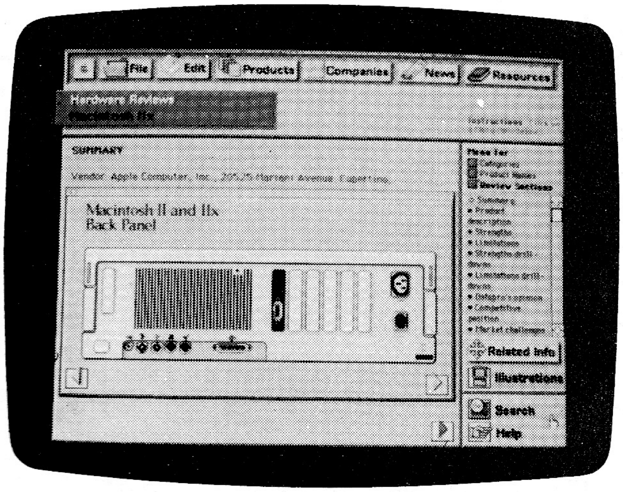
Just another daydream? Hardly. The *Datapro Consultant (Macintosh Edition)*, the first in a line of CD-ROM-based products in the Datapro Consultant product line, allows you to do all that and more. News briefs, comparison columns, product announcements, company profiles, and financial background for major Macintosh product manufacturers—in a hypermedia environment—already make this product a first in the industry. Add the SEE FOR YOURSELF audiovisual feature that lets you view a software program in action, and you have a one-of-a-kind product.

The *Datapro Consultant* is targeted to managers of Macintosh operations and retailers of Macintosh computers. Published quarterly, it costs $299 a quarter; annual subscriptions are $899. Hardware requirements include a Macintosh SE, II/IIX, IIcx, or IIci personal computer and an Apple-compatible CD-ROM reader.

In the works in the *Datapro Consultant* line is an IBM version. For further information, contact John O. Cole, director of electronic publishing, Datapro, 600 Delran Parkway, Delran, NJ 08075. Telephone (800) DATAPRO.

Datapro Consultant Wins Technology Award

McGraw-Hill Chairman and CEO Joseph L. Dionne recently presented John Cole and Thom Holmes of Datapro's Electronic Publishing Department with an Information Technology Award for the *Datapro Consultant (Macintosh Edition)*. The award was given for "multimedia product design for the Macintosh computer platform." In particular, Dionne cited the *Datapro Consultant* as an innovative way to present information to customers. The *Datapro Consultant* is McGraw-Hill's first multimedia information service.



Sample Report Screen from the Datapro Consultant, showing an illustration from a hardware review.

NSTL Rates 2400 bps Modems

(Continued from Page 1)

Figure 1 provides an overview of NSTL's findings. Of the modems listed, NSTL recommends two modems in particular: the Hayes VS Smartmodem 2400 V.42 and the ATI 2400etc/e. NSTL found the Hayes modem easy to configure and superior in performance. At $650, however, it's expensive. The ATI modem, while it does not offer the performance of the Hayes modem, at $299 is a "good low-cost alternative," according to NSTL.

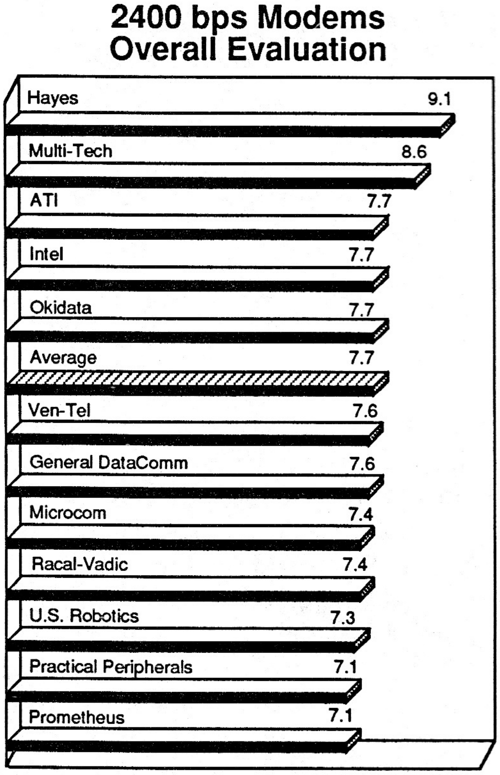


Figure 1. The rating scale ranges from 10 to 1, with 10 excellent and 1 poor.

Source: NSTL/Datapro.

Announcing . . . Volume 2 of *Datapro Reports on UNIX Systems & Software*

The UNIX world moves quickly—with changing standards and increased competition. To keep pace with this rapidly evolving market, Datapro is expanding *Reports on UNIX Systems & Software.* In May, Datapro will publish a second volume of new reports covering the UNIX market, including enhanced coverage of market leaders, such as AT&T, Digital Equipment, Hewlett-Packard, IBM, NCR, OSF, Sun Microsystems, and UNIX International . . . new reports on topics such as IBM's RISC System/6000 . . . AT&T's UNIX System V Release 4 . . . the latest POSIX standards. A completely new section in Volume 2 will profile over 1,500 software packages, for applications areas such as Engineering & Scientific, Accounting, and Data Management.

If you need to stay up to date on the issues, technologies, and product offerings in today's UNIX market, you need *Datapro Reports on UNIX Systems & Software.* For more information, or to receive a review copy of the service, please call Datapro at (800) 328-2776.

May 1990

VOL. 9, NO. 5

Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
ALANET
OCLC Online Computer Library Center, Inc.
How to Look It Up Online
Accessing the Medical Literature Online
Working with Information Brokers

Highlights

It's a big month for librarians! First there's a report on "ALANET," the American Library Association's (ALA's) electronic information service. ALANET provides information primarily for librarians—public, academic, and, to some extent corporate. Aside from offering direct access to library-related databases, ALANET subscribers can "gateway" to databases from VU/TEXT Information Services, Inc., and Dow Jones News/Retrieval. See Report (OL20-024-101) for more details.

Next, we've revised the OCLC Online Computer Library Center, Inc. report. OCLC provides computer-based products and services for libraries and educational organizations. OCLC operates an international computer network that librarians use to acquire and catalog books, order custom-printed catalog cards, and locate books. For further information on OCLC, see (Report OL20-697-101).

We also enhanced two of our tutorials this month by revising two key reports. The first report was developed by Ronald G. Albright, Jr., M.D., who provides a clear, concise picture of what medical database searching is all about. After reading "Accessing the Medical Literature On-line" (Report OL10-600-101), you'll realize how effective and useful medical databases are.

Information brokers provide research help to companies on a fee-paid basis. Almost any company, at times, could use their services. But how do you hire an information broker? What exactly does an information broker do? For the answers, see Report OL10-700-101, "Working with Information Brokers." This tutorial was revised by Helen Burwell, one of the leading information brokers in the country and a top authority on the subject.

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Database Potpourri

News from BRS Information Technologies

BRS has added an important new pharmaceutical database, the *IDIS Drug File.* Produced by Iowa Drug Information Service, *IDIS* is a bibliographic database with detailed indexing of articles on human drug therapy, from over 160 English-language medical and pharmaceutical journals. Coverage includes information on study design, treatment efficacy, study population, dosage, administration technique, pharmacokinetics, pharmaceutics, incompatibilities, drug interactions, toxicology, and side effects.

It costs $52 per hour to search this database on the BRS Search Service. BRS Colleague searchers pay $52 prime time, and $39 non-prime time.

For further information about *IDIS*, contact BRS Customer Services, or the database producer at Iowa Drug Information Service, Oakdale Hall, Oakdale, IA 52319. Telephone (319) 335-4800.

MEDLINE, produced by the National Library of Medicine, has been enhanced and reloaded for 1990. The database now reflects the changes in and additions to the MeSH vocabulary; therefore, it is important to use the current volumes of the **Medical Subject Headings Annotated Alphabetic List** and the **MeSH Tree Structures** to ensure accurate search results. The expansion includes:

- 413 new descriptors (391 major, 22 minor)
- 91 descriptors replaced with more up-to-date terminology
- 8 descriptors deleted
- 63 minor descriptors elevated to majors
- 3 non-MeSH descriptors changed to *Index Medicus* descriptors
- 5 geographic subheadings added for cataloging

The *MEDLINE* database is available in three separate files. *MEDLINE* and Backfiles are available at $25 per hour; *MEDLINE* (merged) is available at $27 per hour; and *MEDLINE References on AIDS* is available at $25 per hour.

For more information, contact BRS Customer Services, or the database producer at National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20894. Telephone (301) 496-6193.

New Products from GE Information Services (GEIS)

GEIS has announced *QuikNews Express*, a personalized electronic news clipping service integrated with its QUIK-COMM System electronic messaging service. This new service allows subscribers to create an interest profile based on search keywords and standing story selections. "Standing stories" are news items on a particular topic that are received regularly, such as leading stock market indicators. GEIS says time savings, convenience, competitive advantage, and information access are the key benefits to *QuickNews Express* subscribers.

GE Information Services also announced the *QUIK-COMM X.400 Access Service*, which connects electronic mail services from GE Information Services and Western Union. Public and private E-Mail users from both sides of the network can now communicate with each other, regardless of the system involved. Not only does GEIS offer an interconnection to the *QUIK-COMM X.400 Access Service*, it also offers a range of interconnections to various other private mail systems.

For more details, contact GE Information Services, 401 North Washington Street, Rockville, MD 20850. Telephone (800) 433-3683.

CD-ROM Titles

Microsoft's *1989-1990 CD-ROM Yearbook* (published by Microsoft Press, Redmond, WA) lists 326 commercially published titles. These include Bowker's *Books in Print*, Merriam Webster's *Ninth New Collegiate Dictionary*, the *Original Oxford English Dictionary*, the *Physician's Desk Reference*, and the *Reader's Guide to Periodical Literature*.

Several business and computer-related services are also available on CD-ROM. These include *Computer Library*, which provides full text of 15 trade publications and abstracts of more than 120 others; *MacGuide USA*, which identifies hardware and software for Apple's Macintosh; *Standard & Poor's Corporations*, which provides financial data on nearly 50,000 public and privately owned companies; and the *Business Software Directory*, which covers more than 10,000 software programs.

In addition to commercial titles, many companies and government agencies publish their own CD-ROMs for internal use.

Although IBM and IBM-compatible microcomputers remain the major CD-ROM platform, the number of titles available for the Apple Macintosh and for workstations has increased.

CD-ROM's Arrival

(Continued from Page 1)

Trends

InfoTech's 1990 Optical Publishing Industry Assessment reported that CD-ROM titles in print increased an astonishing 107 percent in 1989. (For further information on CD-ROM titles, see the related sidebar on Page 4 of this newsletter.) Last year, there were 340,000 CD-ROM readers/players worldwide.

For a long time, CD-ROM growth was hampered by the cost of the drives needed to "play" the disks. Now, that final barrier is eroding—prices are falling.

Granted, Datapro's latest survey of CD-ROM drive manufacturers failed to show a decrease in the overall *range* of prices for CD-ROM drives. Those vendors with the highest (Online) and lowest (Denon) priced drive failed to lower the prices of those particular drives (the range still stands at $450 to $3,695).

Many vendors in between, however, did lower their prices. Overall, Datapro found only a 4 percent price decrease in CD-ROM drives, but a **22 percent average decrease** from those vendors who did decrease their drive prices. The largest decrease was Sony's CDU-510, down 42.5 percent, from $895 to $515.

The Future

CD-ROM and multimedia have come a long way since the mid-1980s. In 1986, CD-ROM developers celebrated a new medium that allowed the organization, access, and management of large amounts of graphic, audio, and textual information on read-only compact disks. One year later, Intel announced interactive DVI technology for television and movies, combining full-motion video with text and graphics on CD-ROM.

Today, CD-ROM drive prices are declining and performance is increasing. CD-ROM titles have more than doubled, and alliances between leading vendors are producing brilliant, new applications. Erasable media applications are developing in tandem, rather than in competition with, CD-ROM, ensuring CD-ROM's continued viability as a publishing medium. As a result of 30-frame-per-second desktop compression, DVI's image resolution is improving to the quality of Digital Television, and development tools are more powerful and easier to use.

What does the future hold? Multimedia on CD-ROM is definitely moving toward the mainstream. For the short term, hardware prices will continue to drop by 10 to 30 percent, and compatibility will emerge as standards are accepted.

Before long, CD-ROM and multimedia applications will become standard equipment in the office, school, and home. To online searchers, the promise of the end of the ticking meter, at least for some of their information sleuthing, is exciting.

—Todd Denton and Brad Schepp

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Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
An Overview of Value-Added Networks
Microcomputers: Market Overview
Microcomputers: Technology Overview
An Overview of European Databases

Highlights

New York in Spring: Time for the annual rite of the National Online Meeting. Now entering its second decade, National Online is the industry's premier showcase for the latest in online technology. See this month's *On-line Briefings* newsletter for our assessment of this year's show.

This month's issue offers an interesting blend of reports, guaranteed to offer something of interest to any reader. If you, or someone you do research for is interested in doing business in Europe, you will want to see our revised report, *An Overview of European Databases* (Report OL70-050-101). It describes many top European databases and gives contact information for many European hosts.

Another report (Report OL70-400-101), *An Overview of Value-Added Networks*, describes the history behind, and the services now offered BT Tymnet, CompuServe Network Services, Sprintnet, and other VANs. For example, many VAN providers now offer electronic mail and electronic data interchange (EDI) services.

Finally, if you are in the market for a new microcomputer, or just want to learn more about where the technology now stands, you will want to see our two revised reports: *Microcomputers: Market Overview* (Report OL70-700-201), and *Microcomputers: Technology Overview* (OL70-700-101).

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July 1990

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Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
Using On-line Databases for Market Research
Washington Watch: Electronic Databases and the Washington Information Machine

COLUMBIA UNIVERSITY LIBRARIES

Highlights

Only 1 or 2 percent of the nation's 70 million Knowledge Workers make use of on-line services. Yet, there are a lot of people who could use online services but don't, for one reason or another. Lately, some vendors, both old and new, have introduced information services designed to bring online information directly to the people who use it, rather than expecting users to retrieve it themselves. Some vendors deliver information by fax, others through electronic mail services. Several of these services are profiled in this month's *On-line Briefings* newsletter.

This issue also includes two updated tutorial reports. Our tutorials, which you will find behind the OL10 tab in Volume 1, are designed to bring end users and other new searchers up to speed on searching on-line databases. Even experienced searchers may find some useful pointers. The first report, "Using On-line Databases for Market Research" (Report OL10-450-101), discusses such key areas as:

- The value of using on-line databases for market research
- On-line financial resources
- On-line news resources
- The CD-ROM option

Market researchers, strategic and competitive analysts, information professionals, and managers of all types will find this report useful.

Our second tutorial, "Washington Watch: Electronic Databases and the Washington Information Machine" (Report OL10-500-101), discusses the nation's largest publisher—the Federal government—and how electronic databases can help you sift through this information treasure trove. Perhaps no other source offers such a diversity of information, from publications such as *Weed Control in Lawns and Other Turf*, to the *Congressional Record*. Any "information consumer" will find this tutorial useful.

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Datapro

On-line Briefings

Technologies, Strategies, Services

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News That Fits Like a Suit

You know it's part of your job to keep up with industry news. In fact, if important news escapes you, your very job can be threatened. Tracking news is even more important for *information professionals*, who must remain current for others as well as themselves.

Yet, staying up to date gets more difficult all the time, especially in the computer industry. There is not only an abundance of news but a multitude of ways to get it—CD-ROMs, fax machines, on-line databases, and the familiar printed page. You may never feel caught up.

Not only that, some of the best tools, such as on-line databases, go unused because of the learning curve. By one estimate, fewer than 1 percent of the nation's 70 million "Knowledge Workers" use on-line databases. Even if that estimate is a little low, it's probably not far off the mark.

Fortunately, a new class of products has emerged, blending computerized information retrieval with electronic information delivery to make staying informed easier than ever. These products, with such catchy names as NewsAgent and INFOAgent, promise to cut down on information age overload by acting as smart filters, prescreening information before it even reaches you. Consequently, they offer a guarantee, of sorts, that the information will interest you. Companies ranging from well-known giants such as Dow Jones, to start-ups such as Individual Inc., of Cambridge, MA, are involved.

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CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH
600 Delran Parkway
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
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UNITED KINGDOM:
Datapro Research
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

Reviewing a Customized Newsletter

I recently sampled Individual Inc.'s First!, one of the customized newsletter services described in the lead article.

To get started, I completed the same steps any subscriber would. I filled out the company's seven-page "First! Profile Generation Form," where I specified companies, markets, and products I wanted to track. I had the choice of fax or MCI Mail delivery. I chose MCI Mail delivery since that meant the information would arrive in electronic form right at my desktop. (By the way, if I had a PC fax card I could have the same thing—desktop convenience, with the information in electronic form.)

Within a few days, my customized newsletters began arriving. Each morning I logged on to MCI Mail to find my own edition of First! On average, each issue featured three stories. It even included a table of contents so I could scan the already finely filtered publication (scan the scan)!

About 60 percent of the stories I received were relevant to my interests. I'm sure this relevancy would improve, by the way, because Individual goes to the trouble of regularly soliciting feedback about the value of the information it delivers to you. As a subscriber, I received a Relevancy feedback questionnaire (a report card of sorts) where I rated each story Individual provided as Not relevant, Relevant, or ? (Unsure).

The process continues every week for four weeks, then once a month thereafter. I'm certain that with one or two more iterations my newsletter could hit the 70 percent relevancy level or even greater. Compared to your average trade publication or newspaper, that's a remarkable rate.

For now, Individual Inc. has the same drawback that most electronic delivery media do. It's too expensive for many people (although Individual takes a lot of the sting out of the price by offering group discounts). But given the convenience and the value of the information, I'm certain this will be the way many of us receive information in the near future.

Brad Schepp

Database Potpourri

Dow Jones—Dow Jones recently demonstrated its new DowVision information service. DowVision is an electronic information service that delivers customized information straight to users' desktops (see lead article). The company also continues to announce new "Alliance Developers"—companies that take DowVision news and customize it to meet users' needs.

In other news, the company's Dow Jones Information Services group activated a remote-host database computer at Kyodo News Service in Tokyo. The computer will support Dow Jones News/Retrieval customers, making it possible for them to make a local call to access Dow Jones databases. Previously, their only option was to incur the high costs associated with dialing through packet-switching networks back to the U.S.

For further details, contact Dow Jones & Company, P.O. Box 300, Princeton, NJ 08543. Telephone (609) 520-4000.

US Sprint—Radio Free Europe, the international broadcaster based in Munich, will distribute its newsletter, *The Radio Free Europe/Radio Liberty Daily Report*, via SprintFAX, US Sprint's automated fax service.

For more information, contact United Telecom, P.O. Box 11315, Kansas City, MO 64112. Telephone (913) 676-3000.

Telebase—The parent of the popular EasyNet gateway, which provides access to more than 850 databases from more than a dozen different vendors, has enhanced its SmartSCAN feature. SmartSCAN lets users run a search across several databases at once to see which databases would yield the most hits. The enhancement permits faster searching of more SmartSCAN databases.

For details, contact Telebase Systems, Inc., 763 W. Lancaster Avenue, Bryn Mawr, PA 19010. Telephone (215) 526-2800.

National Technical Information Service (NTIS)—The National Technical Information Service announced the availability of three directories designed to provide easy access to Japanese online databases, technical reports, and technical resources.

Directory of Japanese Technical Resources in the United States—1990 (Fourth Edition)—Lists commercial services, government agencies, and libraries that specialize in Japanese information ($39).

Directory of Japanese Databases—Full descriptions of 43 Japanese databases accessible from within the United States ($35).

Directory of Japanese Technical Reports—Summarizes 1,500 technical reports that NTIS added to its collection in 1989.

For more information, contact the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Telephone (703) 487-4650.

Mead Data Central—Mead Data Central (MDC) and the American Banker's Association (ABA) announced they have agreed to unveil a special service for bankers interested in gaining on-line access to MDC's NEXIS and LEXIS information services. The new program provides for special rates and should be especially appealing to banks with assets of more than $150 million.

For details, contact Mead Data Central, 9393 Springboro Pike, P.O. Box 933, Dayton, OH 45401. Telephone (513) 865-6800.

Customized News

(Continued from Page 1)

These services typically apply artificial intelligence to information gathering. Individual Inc.'s First! service, for example, offers what it says is the "first software able to evaluate the relevance of information presented to it." The software scans through 35,000 computer-related wire stories per month, looking for articles that match the subscriber's interest profile. (Sources include PR Newswire, Business Wire, UPI, Kyodo, and Reuters.) The more matches, the higher the presumed relevance. Not only that, the software is smart enough to know that words appearing in titles or lead paragraphs are likely more important than those buried deep within a story. (In fact, the software is even called SMART, for System for Manipulation and Retrieval of Text.)

Individual's system takes your keywords and user profile to analyze articles. It then measures their relevance to you. So it does not depend solely on your keywords in doing a search. It takes into account, for example, that articles about working at home with computers may interest someone who's tracking telecommuting, even though the word telecommuting does not appear anywhere in the article. This approach is typical of systems using artificial intelligence.

These services typically only scan newswires such as PR Newswire or Business Wire. Increasingly, however, they will scan other sources, including trade journals, to greatly boost their value. Information arrives via fax, E-Mail, or directly to your in-house LAN (which perhaps is the most convenient delivery option of all). In fact, desktop delivery is the strongest selling point of DowVision, a new service from Dow Jones & Company. DowVision provides news from the Dow Jones News Service, the PR and Business News wires, Professional Investor Report, Capital Markets Report, Dow Jones International News Service, and Federal Filings.

Services cost about $2,000 to $10,000 per year. Individual, for example, charges $1,995 per year for a Basic Service (up to 500 stories) to $6,750 for its Comprehensive Service (up to 2,000 stories). The fixed pricing allows for easier budgeting than on-line services do.

It's very tempting to let these services handle your research needs. If not for the steep price, few people could resist giving them a try. (See the Editorial View on Page 2 for our impressions of Individual's First! service.)

—Brad Schepp

Introducing . . . Datapro Reports on Applications Software

Are you looking for in-depth information about CASE products? Decision Support Software? Executive Information Systems? Let Datapro help. Our new service, *Datapro Reports on Applications Software,* contains information on these solutions and more. Other sections cover Integrated Financial Planning, Human Resources, Purchasing, Integrated Business Accounting, and Artificial Intelligence.

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Of course you'll find the full report coverage you've come to expect from Datapro, on vendors such as Index Technology, IBM, Digital Equipment, Global, SAS, Dun & Bradstreet—and many more.

If you're looking for up-to-date applications solutions for your environment, let *Datapro Reports on Applications Software* help. For more information, or to receive a review copy of the service, please call Datapro at (800) 328-2776.

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Reuters	OL20-790-101	5	10/88
Securities Data Company, Inc.	OL20-823-101	3	11/88
Standard & Poor's Compustat Services, Inc. (SPCS)	OL20-846-101	4	7/89
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TRW Information Services Division	OL20-922-101	3	9/88
VU/TEXT Information Services, Inc.	OL20-961-101	10	3/89
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On-line Databases—A-C	OL40-100-101	101	12/89
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Twelve newsletters			

Delran NJ 08075 USA

August 1990

VOL. 9, NO. 8

Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
Accessing Second-Tier Information Utilities
Communicating by Macintosh

Highlights

Two *new* tutorial reports are spotlighted this month. "Communicating by Macintosh" provides useful information for all Macintosh owners and anyone else interested in on-line communications. Hundreds of thousands of Macintosh computers are sold every year. Also, more and more good telecommunications packages are becoming available for them, making this tutorial especially important. The report describes several of the leading communications software programs for the Macintosh. Aside from the technical data, however, the report covers more theoretical issues. For example, what are the benefits of using a Macintosh for telecommunications? Taking a step back from even that, what are the benefits of using a Macintosh computer for *anything* (as compared to using an MS-DOS-based computer)? For the details, see report OL10-250-101.

On-line searchers are well aware of the services that DIALOG, BRS, Dow Jones News/Retrieval, and the other well-known companies in the field offer. Just beneath this tier of services, however, are several important but less well-know services. "Accessing Second-Tier Information Utilities" (Report OL10-800-101) covers them, providing details on The WELL, Exec-PC, the BYTE Information Exchange (BIX), and PC MagNet. These services offer software and information not available from the larger on-line services.

Both new reports, by the way, reprint material that originally appeared in *Dvorak's Guide to PC Telecommunications*, a best-selling book from Osborne/McGraw-Hill.

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Datapro

On-line Briefings

Technologies, Strategies, Services

VOL. 9, NO. 9
SEPTEMBER 1990

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Telecommuting: Questions and Answers

The federal government will soon begin a large demonstration program to assess *telecommuting*: working for an employer from home. Thousands of federal employees spanning many agencies will take part. Many on-line and high-tech companies (e.g., Information Access Company, Apple Computer) are already sold on telecommuting, having used it for some time with good results. Still, myths and questions about telecommuting abound. What exactly is it? Who does it? How can you "take your job home?"

The following discussion should help clarify many of these points. To gather this material, Datapro spoke with several authorities in the field.

Q: What is "Telecommuting"?

A: Telecommuting refers to using telecommunications technology to replace commuting. That is, working away from the office, from a remote site, with the help of a telephone, or computer and modem to get your job done and stay in touch with your boss and coworkers.

Q: How many people telecommute?

A: Estimates vary widely from 100,000 to 5 million. Not everyone defines telecommuting the same way, which accounts for some of the variation among estimates. Also, much telecommuting goes unreported. Many telecommuters telecommute informally. They have worked out private arrangements with their supervisors to work from home one or more days a week. This "guerilla" telecommuting is widespread, but obviously it's difficult to pin down just *how* widespread!

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Group Managing Editor
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Brad Schepp

Research Associate
Melissa S. Cymbor

CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH GROUP
600 Delran Parkway
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research Group
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research Group
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Editorial View

Computer Commuting to School

Once you enter the work world, continuing your formal education is inconvenient to say the least. It can be like working two jobs, which means that neither one gets the attention it should. Not only that, you have to travel to a campus (not always conveniently located) at the end of the workday, when few of us are at our best.

Those of us familiar with telecommunications have another option—we can "attend" class via modem *whenever it is convenient.* Sound too good to be true? Connected Education, in conjunction with New York City's New School for Social Research, has offered courses via modem for years. In fact, in the past five years Connected Education has offered more than 150 graduate and undergraduate courses via computer conferencing to more than 750 students across 28 states, and internationally from many parts of the world including Holland, England, France, Iceland, Singapore, and Canada.

Courses cover trends in telecommunications, the effects of modern technology on our lives, and practical concerns such as desktop publishing and technical writing. You can even earn a degree this way. Qualified students can pursue an MA in Technology and Society entirely via Connect Ed on-line courses.

Finally, Connected Ed also sells diskette-based books including novels, short stories, poetry, commentary, scholarly essays, and scholarly books. It also sponsors on-line seminars, which you attend via computer and modem. A recent seminar covered Electronic Data Interchange and was hosted by Benjamin Wright, author of *EDI and American Law.* Registrants are allowed to access the course whenever they want over the course of a month.

For further information, contact Connected Ed's president, Paul Levinson, at 92 Van Courtland Park S., #6F, Bronx, NY 10463. Telephone (212) 549-6509.

Brad Schepp

December 1990

VOL. 9, NO. 12

Datapro Directory of On-line Services

In This Issue

On-line Briefings Newsletter
Pergamon Financial Data
  Services (PFDS)
Optical Storage
  Market Overview
  Technology Overview
  Comparison Columns

Highlights

This month's issue of *Datapro Directory of On-line Services* includes the latest version of our survey report on the optical storage market. "Optical Storage: Market Overview" (Report OL70-800-101) discusses market segments, market leaders, trends and issues, vendor strategies, and future directions for optical storage. "Optical Storage: Technology Overview" (Report OL70-800-201) discusses the technology that forms the basis for the three main optical storage types—CD-ROM, write-once, and rewritable. "Optical Storage: Comparison Columns" (Report OL70-800-301) provides detailed specifications and pricing for optical storage products in Datapro's easy-to-use comparison column format. Four sets of columns—CD-ROM, write-once, rewritable, and optical storage jukeboxes—provide info on over 250 products.

We have also revised our report on "Pergamon Financial Data Services (PFDS)" (OL20-741-101). London-based PFDS, a division of Maxwell Business Information Services Ltd., has increased its database offerings to nearly 50. Our report will give you a complete rundown on the databases offered by PFDS.

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Database Potpourri

SCAN C2C has announced that its Japan Technology database will be available on DIALOG Information Services in February 1991. Japan Technology is also offered on ORBIT Search Service.

The database provides English-language coverage of such Japanese industries as biosciences, chemistry, computers, electronics, energy, manufacturing, and materials. It contains over 150,000 records from 1985 to the present; an additional 3,000 to 4,000 records are added each month. According to Tom Satoh, president of SCAN C2C, "The database is an ideal way for technical, market, and academic researchers to stay abreast of the latest developments in Japan."

For further information, contact SCAN C2C, 500 E Street, Suite 800, Washington, DC 20024. Telephone (202) 863-3850.

Information Access Co. was very active in October. First, the company announced that it would add two full-text databases to Data-Star, the largest on-line information service in Europe. The Trade & Industry Database provides local, regional, and international coverage of industry and company news. Magazine Database covers American current events, politics, trends, and popular culture.

"We are pleased to introduce two of our most popular databases to Data-Star customers," said Morris Goldstein, president of Information Access Co. "Trade & Industry Database represents a significant addition to Data-Star, especially in today's competitive trade and investment environment and trend toward a more independent global economy." Goldstein added that Magazine Database is the first such database to provide full-text searching of general-interest articles profiling American political views, cultural trends, and contemporary life-styles. "It is also one of the few databases with crossover appeal among business, government, and academic users who monitor and analyze public taste and opinion."

Trade & Industry Database contains citations to nearly 4 million records gathered from over 1,100 trade journals and industry publications. Magazine Database contains citations to nearly 3 million records gathered from over 435 U.S. magazines. Both databases are updated weekly. As a special introductory offer, Data-Star customers will receive 30 minutes of free search time on the two databases in mid-January 1991.

Information Access has announced the addition of the Expanded Academic Index to its InfoTrac library of CD-ROM databases. The new InfoTrac CD-ROM database is a significantly expanded version of the Academic Index. Expanded Academic Index contains more than 960 scholarly journals, nearly three times the number of publications covered in the Academic Index. In addition to covering major titles in the academic disciplines, it also contains general interest publications as well as *The New York Times*. InfoTrac is designed for research in the humanities, social sciences, and general sciences; the new database will be available in early 1991.

Information Access has expanded the distribution channels for its tape and CD-ROM databases with a new database licensing program and agreements with seven library automation organizations. The new plan, called the InfoTrac 2000 Database Licensing Program, includes 10 databases: General Periodicals Index, Magazine Index Plus, Expanded Academic Index, Academic Index, Business Index, Computer

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Database, National Newspaper Index, Health Index, Legal Resource Index, and Business and Company ProFile. Library automation companies that have joined the program include Auto-Graphics, Inc. (Pomona, CA), Brodart (Williamsport, PA), Colorado Alliance of Research Libraries (Denver, CO), Data Research Associates (St. Louis, MO), NOTIS Systems, Inc. (Evanston, IL), Sirsi (Huntsville, AL), and Virginia Tech Library Systems (Blacksburg, VA).

Contact Information Access Co. at 362 Lakeside Drive, Foster City, CA 94404. Telephone (415) 378-5000.

VU/TEXT announced that the full text of wire stories from the Scripps Howard News Service is now available on VU/TEXT. Scripps Howard News Service offers 60 to 80 stories daily, covering a variety of news, entertainment, life-style, health, science, financial, international, and sports topics.

Scripps Howard's wire service contains stories drawn from the Scripps Howard newspapers plus *The* (London) *Observer*, *Congressional Quarterly*, *San Francisco Examiner*, *St. Petersburg Times*, *St. Louis Post-Dispatch*, *The Kansas City Star*, *The* (Providence) *Journal*, (Minneapolis-St. Paul) *Star Tribune*, and *The* (Toronto) *Globe and Mail.* Cost to access the Scripps Howard News Service database is $1.80 per minute for Option I subscribers, and $2.20 per minute for Option II subscribers.

VU/TEXT has also added the *Press-Telegram* of Long Beach, CA, to its menu of newspapers available on-line. The *Press-Telegram* provides full-text coverage of people, industries, and issues in the Long Beach metropolitan area, focusing on Los Angeles County and Orange County. On-line costs are $1.80 per minute for Option I subscribers and $2.20 per minute for Option II subscribers.

For more information, contact VU/TEXT Information Services, Inc., 325 Chestnut Street, Suite 1300, Philadelphia, PA 19106. Telephone (215) 574-4400.

Thomson & Thomson has enhanced its TRADEMARKSCAN-Federal and State databases. The enhancements are designed to help users conduct more comprehensive searches for trademark designs and logos; to locate information on specific federal or state trademarks; and to gather trademark ownership data more easily and completely. The TRADEMARKSCAN databases are available on DIALOG Information Services.

The Design Code Search Capability in the TRADEMARKSCAN-Federal database provides for more thorough and precise searches for specific design elements associated with trademark registrations and applications filed with the U.S. Patent and Trademark Office. This feature can be used to run a preliminary screening search for designs that might conflict with a proposed logo or to seek out images to support litigation.

"Since its launch in 1983, the TRADEMARKSCAN line has been meeting and evolving around the trademark research requirements of thousands of legal and business professionals worldwide," said Anthea Gotto, Thomson & Thomson's manager of online marketing. Gotto indicated the enhancements are a result of user feedback.

For additional information, contact Thomson & Thomson, 500 Victory Road, North Quincy, MA 02171-1545. Telephone (617) 479-1600.

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Computers: Sharing the Wealth

It's a striking advertisement. "What good is a computer if it can't feed a hungry child?" The question, set in 40-point white type on a black background, leaps out from the page of a journal devoted to esoteric programming techniques or the latest in expert system software. Perhaps the reader—among many other computer professionals—first became interested in computers from envisioning how they would make things better—for everyone—soon.

A few computer professionals believe that soon is *now*, but for computers to help people, first people have to help people. The CompuMentor Project began working on this very task in late 1986. That's when founder Daniel Ben-Horin began trying to match computer professionals with nonprofit organizations in the San Francisco Bay area. The groups looking for computer wizards covered the entire spectrum of social services from agencies working with the homeless, abused children, and the elderly, to councils on the arts and education for the needy, and ecological watchdog groups. Their needs were simple, spanning help selecting the correct computer and accompanying software for their tasks, to training on computers and applications they had already acquired. They also needed word processors, accounting packages, database management systems, and spreadsheets. Many of them wanted to access on-line databases and exchange electronic mail with similar groups in the country. All needed ongoing assistance to manage the dozens of questions and problems that arise in the daily use of computer hardware and software.

Since the Bay area includes Silicon Valley, Ben-Horin had many skilled people to seek out. Initial contacts with mentor volunteers were made on the WELL, a popular Bay Area electronic bulletin board system originally begun by the group responsible for the *Whole Earth Catalog.* While this approach yielded enough people to get things started, the need for skilled mentors soon outstripped the WELL's capability to provide them. At about the same time, a column called "Inside Silicon Valley" by Denise Caruso in the *San Francisco Herald-Examiner* described the CompuMentor project and that set the phones ringing. More articles in the press and contacts with user groups spurred volunteers. Grants from such industry giants as Apple Computer and Pacific Telesis provided the capital necessary to keep the project staffed full time and handle the flood of both volunteers and groups seeking mentors.

Today CompuMentor has nearly 300 mentors helping approximately 200 nonprofit groups in and around San Francisco. Ben-Horin and his group hope to help form new CompuMentor groups throughout the country. A 58-page booklet, *CompuMentoring—People Helping Computers Help People*, provides much advice for those who wish to start their own CompuMentor group. Issues such as where and how to obtain funding, and how to get the word out to both potential mentor volunteers and groups that need mentors, are covered in depth.

Ben-Horin and his associates believe the story of CompuMentor has only begun. They are confident that soon CompuMentor groups will appear in most American cities. To further this end, they're offering the CompuMentoring booklet and other materials and assistance free to anyone interested in starting a mentor group. Contact CompuMentor at (415) 255-6040 or write to 385 8th Street, 2nd Floor, San Francisco, CA 94103.

—John Krick

Telecommuting

(Continued from Page 1)

Q: What jobs are suitable for telecommuting?

A: Many telecommuters are knowledge workers—they create or manipulate information. Much of what they do can be done anywhere, as long as there is a telephone; desk; chair; and, if needed, a computer handy.

Q: Which companies have telecommuters?

A: A handful of companies, among them J.C. Penney, Blue Cross/Blue Shield of South Carolina, Pacific Bell, and The Travelers Companies, have formal telecommuting programs. These programs were often set up by consultants, are condoned by top management, and have been the focus of many news stories. But, as mentioned, most telecommuting is done informally. Some of the many companies with informal telecommuting are AT&T, Apple Computer, DuPont, IBM, Weyerhauser, John Hancock, and Sears.

Q: What are telecommuting's advantages?

A: That's easy. Here are just a few:

- More control. Telecommuters can work when they are at their best, run errands when it's convenient, schedule things to meet their needs.
- Money savings. Telecommuters save money on gas, tolls, clothes (no more dress-for-success routine), and restaurant lunches.
- Less stress. Telecommuters eliminate many sources of stress, including the stress that comes from commuting and working closely with people who you might otherwise have little to do with.
- Greater productivity. On the average, telecommuters are 20 percent more productive than their office-based counterparts.

Q: What are telecommuting's drawbacks?

A: Unfortunately, that's also easy to answer.

- Isolation. Someone who works from home may not see anyone else the entire day, except for maybe the letter carrier or another delivery person.
- Constant temptation. For some, the constant presence of the refrigerator or liquor cabinet is too much to bear.
- Need for self-discipline. Because there are no supervisors or coworkers around, telecommuters must sometimes push themselves to keep working.
- Being bumped off the fast track. If you want to zip up the corporate ladder, you will have to work hard to ensure that telecommuting does not hold you back. In other words, you must make sure you still get the attention and notice you deserve.

For some, perhaps 20 percent of telecommuters, these problems send them back to the office. But given the choice, most telecommuters would *never* go back!

Q: OK, I'm sold! How do I become a telecommuter?

A: Basically, it's a matter of making your pitch to your current employer and persuading him/her to let you give it a try. The key is to position it as something that will benefit the employer.

—Brad Schepp

Datapro

On-line Briefings

Technologies, Strategies, Services

VOL. 9, NO. 12
DECEMBER 1990

Database Potpourri 3

CD-ROM Info Delivered on SilverPlatter

This month's issue includes the latest version of our report on optical storage products, technology, and the market. Therefore, in this issue of *On-line Briefings*, we decided to take a look at what's happening with one of the leading providers of information on CD-ROM, SilverPlatter Information, Inc. (Newton Lower Falls, MA).

October was a busy month for SilverPlatter. On October 3, the company made three announcements. First, it announced it would publish *COMLINE*, from COMLINE International (Tokyo, Japan), on CD-ROM; delivery is scheduled for early 1991. COMLINE contains English-language summaries of commercially important Japanese product and technology news from 1986 to the present. The annual subscription price for COMLINE will be $2,900. The database will be updated bimonthly; separate prices apply for use in a network environment.

Next, SilverPlatter announced that it has begun shipping its *EconLit* CD-ROM. Published by the American Economic Association and produced by the Journal of Economic Literature, EconLit includes bibliographic citations and selected abstracts to international literature in the field of economics from 1969 to the present. The annual subscription price for EconLit is $1,600; it is updated quarterly.

Finally, SilverPlatter announced the shipment of its *TROPAG & RURAL* database on CD-ROM. Priced at $750 for an annual subscription (updated semiannually), TROPAG & RURAL covers crop production, crop protection, farming systems, postharvest systems, cultural practices, and environmental

(Continued on Page 2)

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J. Richard Peck

EDITORIAL STAFF

Group Managing Editor
Lester P. Sitzes

Associate Managing Editor
Joseph F. Kelly

CUSTOMER SERVICE
Telephone (800) 328-2776

DATAPRO RESEARCH GROUP
600 Delran Parkway
Delran, NJ 08075
(609) 764-0100

CANADA:
Datapro Research Group
330 Progress Avenue,
Scarborough, Ontario
M1P 2Z5.
Telephone (800) 668-9308.

UNITED KINGDOM:
Datapro Research Group
McGraw-Hill House
Shoppenhangers Road
Maidenhead, Berkshire
SL6 2QL England
Telephone (44) 628 773 277
Telex 848484 MCHILL G

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Reprints of the articles in Datapro On-line Briefings may be purchased for distribution within your organization. To inquire or place a reprint order, please call 1-800-328-2776.

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SilverPlatter

(Continued from Page 1)

relationships in the tropical and subtropical regions from 1975 to the present. The database is produced by The Royal Tropical Institute (KIT) of The Netherlands.

On October 5, SilverPlatter announced the delivery of *SEDBASE* on CD-ROM in January 1991. Developed by Elsevier Science Publishers, SEDBASE contains information on clinically relevant side effects and interactions of all drugs currently in use. An annual subscription costs $995 and is updated semiannually.

Twelve days later, the company said it was shipping the *CLAIMS/ Patent* database on CD-ROM. Developed by IFI/ Plenum Data Corp., CLAIMS/ Patent covers all patents issued by the U.S. patent office since 1950. SilverPlatter's CD-ROM costs $1,895 for an annual subscription with bimonthly updates.

On October 25, SilverPlatter announced the January 1991 release of *Biological Abstracts/RRM (BA/RRM)* on compact disk. This database provides indexed and classified bibliographic entries for research reports, reviews, and books in biology and medicine. It joins Biological Abstracts (BA) in SilverPlatter's collection of health and science databases. BA/RRM will be on two disks—one will include 1989-90, and the other will include 1991 and 1992—and will be updated quarterly. A subscription to the BA/RRM on CD runs $7,805 and is updated quarterly; however, there are significant discounts offered to subscribers of the print version offered by BIOSIS, producer of the database.

SilverPlatter was one of the first providers of information on CD-ROM and offers more than 50 titles on compact disk. Many of the company's CD-ROMs can be searched using a PC or Macintosh, and all can be accessed from SilverPlatter's MultiPlatter CD-ROM network. SilverPlatter's retrieval software is similar among all of its CD-ROM databases, so software functions and search techniques need not be completely relearned when moving from one database to another.

—Joseph F. Kelly

NEWS
NEWS
NEWS

Datapro Research
McGraw-Hill Information Systems Company
1221 Avenue of the Americas
New York, New York 10020

For Immediate Release

IS THE "PAPERLESS OFFICE" FINALLY HERE?

A Growing Number of Vendors, Including IBM, GE, McDonnell Douglas, Commits to EDI, Says Datapro

NEW YORK, N.Y., July 27, 1988—IBM, GE and McDonnell Douglas are among the growing number of companies that have embraced EDI to save time and money, according to the July issue of Datapro Reports on Retail Automation.

EDI (Electronic Data Interchange) is to common business documents what EFT (Electronic Funds Transfer) is to financial transactions: the elimination of the paper document. In an EDI environment electronic messages substitute for conventional business documents among parties who agree to engage in this type of transactions by becoming "trading partners." This partnership enables computers to communicate through a series of standardized data formats such as Invoice, Request for Quotation, Quotation, Credit Memo, Purchase Order, Bill of Lading and Remittance Advice.

By replacing preparation and physical transportation of paper documents with electronic messages, EDI can provide trading partners with reduced costs and increased communication speed. Companies processing a large number of transactions such as Fortune 1000 corporations, government offices, manufacturers, retailers and grocery chains have responded positively to EDI, also aided by the stabilization of standards for message formats at several levels including industry-specific and industry-wide.

Commercially available EDI products and services by 11 vendors are listed and evaluated by the Datapro report. Individual products' features and EDI-related issues such as adherence to standards and security control procedures are also analyzed.

The report is published in Datapro Reports on Retail Automation, Datapro's subscription service for companies involved in retailing, and is available separately as a Feature Report for $35. For more information contact Datapro at 1805 Underwood Boulevard, Delran, New Jersey 08075, (609) 764-0100, ext. 2203.

User's Guide—How to Get the Most from Your Subscription

OUR AIM IS TO HELP

If you already subscribe to this publication, or even if you are just reviewing it for possible purchase, you are probably acquainted with on-line databases and their potential. You know that on-line databases, more than anything before them, have democratized information, making the kind of information previously available only from the largest libraries available to anyone with a microcomputer or communicating terminal. With more than 3,500 databases to choose from and more than 500 database providers offering access to these databases, however, it's difficult to know just where to turn for the information you need. It's safe to assume that the information you need is probably available on-line, but where? What's more, several databases may cover the same terrain. How do you choose among them?

Remote computing services present a similar quandary. There are hundreds of remote computing services from which to choose. Pinpointing the best one for your application can be mind boggling. Perhaps you've even heard that some companies now use microcomputers for many applications formerly done on a time-sharing basis. Therefore, do you even need to contract with a time-sharing service?

Relax. This publication is your road map, your personal guide, to the on-line services now available. It's designed to make your on-line database research as productive as possible and to help you to choose a remote computing service that best fulfills your computing needs. However, just as the *Datapro Directory of On-line Services* will make your on-line explorations easier, this User's Guide will explain how you can derive the most from your subscription to this information service. The time you spend reading this User's Guide, then, is time well spent. When you are finished, you'll be able to reap the maximum benefit from this information service.

HOW THE SERVICE IS ORGANIZED

A Loose-Leaf Information Service

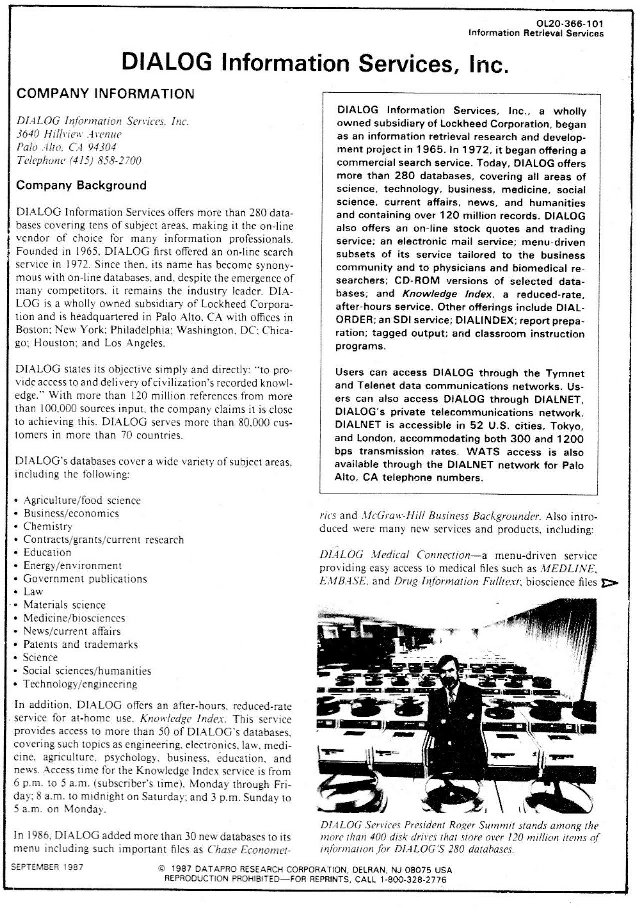
A subscription to the *Datapro Directory of On-line Services* consists of two volumes of *regularly updated* materials. The loose-leaf format accommodates the dynamic nature of our publication. Each month you'll receive a fresh issue, which you'll want to file as soon as possible. It will include new reports, updates to existing reports, an updated Table of Contents, current indices, and our monthly newsletter. The loose-leaf format allows easy assimilation of this new information. It also makes removing previously filed materials simple. You can retrieve the exact information you need, when you need it. You can then take it to your work area, without having to take the entire volume of information along.

This User's Guide describes the *Datapro Directory of On-line Services*. It explains the organization of the service and the purpose of the various reports, indices, profiles, and other features it includes. By reading this User's Guide, you'll learn how to make the most of your subscription and, through your subscription, you'll learn how to use on-line databases, remote computing services, and other on-line technologies to their maximum potential.

The Page Numbering System

The manner in which the pages are numbered is easily understood. Indeed, the numbering method was designed to make locating information as simple as possible.

Each number consists of three parts, e.g., **OL20-366-101.** The components of a sample page number, OL20-366-101, are as follows:



OL20-366-101
Information Retrieval Services

DIALOG Information Services, Inc.

DIALOG Information Services, Inc., a wholly owned subsidiary of Lockheed Corporation, began as an information retrieval research and development project in 1965. In 1972, it began offering a commercial search service. Today, DIALOG offers more than 280 databases, covering all areas of science, technology, business, medicine, social science, current affairs, news, and humanities and containing over 120 million records. DIALOG also offers an on-line stock quotes and trading service; an electronic mail service; menu-driven subsets of its service tailored to the business community and to physicians and biomedical researchers; CD-ROM versions of selected databases; and *Knowledge Index*, a reduced-rate, after-hours service. Other offerings include DIALORDER; an SDI service; DIALINDEX; report preparation; tagged output; and classroom instruction programs.

Users can access DIALOG through the Tymnet and Telenet data communications networks. Users can also access DIALOG through DIALNET, DIALOG's private telecommunications network. DIALNET is accessible in 52 U.S. cities, Tokyo, and London, accommodating both 300 and 1200 bps transmission rates. WATS access is also available through the DIALNET network for Palo Alto, CA telephone numbers.

COMPANY INFORMATION

DIALOG Information Services, Inc.
3640 Hillview Avenue
Palo Alto, CA 94304
Telephone (415) 858-2700

Company Background

DIALOG Information Services offers more than 280 databases covering tens of subject areas, making it the on-line vendor of choice for many information professionals. Founded in 1965, DIALOG first offered an on-line search service in 1972. Since then, its name has become synonymous with on-line databases, and, despite the emergence of many competitors, it remains the industry leader. DIALOG is a wholly owned subsidiary of Lockheed Corporation and is headquartered in Palo Alto, CA with offices in Boston; New York; Philadelphia; Washington, DC; Chicago; Houston; and Los Angeles.

DIALOG states its objective simply and directly: "to provide access to and delivery of civilization's recorded knowledge." With more than 120 million references from more than 100,000 sources input, the company claims it is close to achieving this. DIALOG serves more than 80,000 customers in more than 70 countries.

DIALOG's databases cover a wide variety of subject areas, including the following:

- Agriculture/food science
- Business/economics
- Chemistry
- Contracts/grants/current research
- Education
- Energy/environment
- Government publications
- Law
- Materials science
- Medicine/biosciences
- News/current affairs
- Patents and trademarks
- Science
- Social sciences/humanities
- Technology/engineering

In addition, DIALOG offers an after-hours, reduced-rate service for at-home use, *Knowledge Index*. This service provides access to more than 50 of DIALOG's databases, covering such topics as engineering, electronics, law, medicine, agriculture, psychology, business, education, and news. Access time for the Knowledge Index service is from 6 p.m. to 5 a.m. (subscriber's time), Monday through Friday; 8 a.m. to midnight on Saturday; and 3 p.m. Sunday to 5 a.m. on Monday.

In 1986, DIALOG added more than 30 new databases to its menu including such important files as *Chase Econometrics* and *McGraw-Hill Business Backgrounder*. Also introduced were many new services and products, including:

DIALOG Medical Connection—a menu-driven service providing easy access to medical files such as *MEDLINE*, *EMBASE*, and *Drug Information Fulltext*; bioscience files ▷

DIALOG Services President Roger Summit stands among the more than 400 disk drives that store over 120 million items of information for DIALOG'S 280 databases.

SEPTEMBER 1987

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Figure 1. Company Reports provide a detailed overview of the most important database providers and remote computing services in the on-line industry. In addition to describing product lines and giving pricing details, these reports include Datapro's analysis of the vendor's standing in the market. Company Reports are used to take a close look at a specific vendor of interest.

User's Guide—How to Get the Most from Your Subscription

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Figure 2. Shown here are the contents of each volume of the Datapro Directory of On-line Services, broken down by volume and tab.

OL20—tab section number

366—report number

101—beginning page number

As you can see, the first part of the number refers to the specific tab section in the On-line Services publication.

The second part of the number, separated from the first part with a hyphen, identifies a specific report found in a tab section.

The third part of the number, also separated by a hyphen, is the starting page number of the report. This number will often be -101 for the Company Reports. The page numbers then increase sequentially through the body of the report (e.g., -101, -102, -103, etc.).

Figure 2 shows the contents of each volume of the *Datapro Directory of On-line Services*, broken down by volume and tab. A description of each tab follows.

The Monthly Newsletter (OL99)

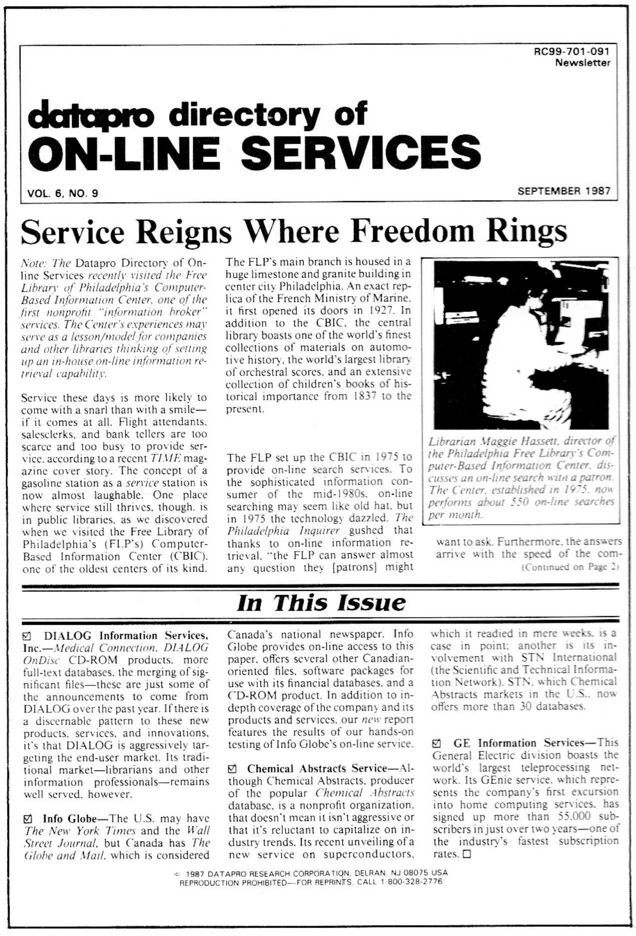
Before we discuss the various reports, profiles, etc., that make up the *Datapro Directory of On-line Services*, let's consider the monthly newsletter, included in your subscription.

The newsletter (Figure 3) appears on the top of each monthly issue you'll receive. It has two purposes.

First, it reports on major events, trends, or news stories in the on-line industry. Three separate sections of the newsletter include this kind of information. The *lead article* ("cover story") tackles a story in depth. It brings you our editors' analysis of the most significant issue currently facing the industry or the most important new product announcement. On occasion, a case study, in-depth company profile, or technology overview may appear in the cover story spot. The *In the Industry* section, usually beginning on page 2, briefly describes the most significant new on-line products, or product enhancements, announced over the course of the last month or so. Our opinions regarding the impact of such announcements are often included. This section may also feature a "mini review," that is, our hands-on evaluation of a new database, database provider, or communications-related software package. Finally, the *From the Editor's Desk* article on page 3 is a forum for our senior editors to speak directly to our readers. Written in a conversational style, this section may include commentary on industry trends or events or news of enhancements to the *Datapro Directory of On-line Services.*

The newsletter's articles are indexed in the following month's *Company/Database Index*, to allow for quick retrieval.

The newsletter's other purpose is to briefly describe the most significant reports appearing in the current month's issue, as well as those scheduled for future issues. We



RC99-701-091
Newsletter

datapro directory of
ON-LINE SERVICES

VOL. 6, NO. 9 SEPTEMBER 1987

Service Reigns Where Freedom Rings

Note: The Datapro Directory of On-line Services *recently visited the Free Library of Philadelphia's Computer-Based Information Center, one of the first nonprofit "information broker" services. The Center's experiences may serve as a lesson/model for companies and other libraries thinking of setting up an in-house on-line information retrieval capability.*

Service these days is more likely to come with a snarl than with a smile—if it comes at all. Flight attendants, salesclerks, and bank tellers are too scarce and too busy to provide service, according to a recent *TIME* magazine cover story. The concept of a gasoline station as a *service* station is now almost laughable. One place where service still thrives, though, is in public libraries, as we discovered when we visited the Free Library of Philadelphia's (FLP's) Computer-Based Information Center (CBIC), one of the oldest centers of its kind.

The FLP's main branch is housed in a huge limestone and granite building in center city Philadelphia. An exact replica of the French Ministry of Marine, it first opened its doors in 1927. In addition to the CBIC, the central library boasts one of the world's finest collections of materials on automotive history, the world's largest library of orchestral scores, and an extensive collection of children's books of historical importance from 1837 to the present.

Librarian Maggie Hassett, director of the Philadelphia Free Library's Computer-Based Information Center, discusses an on-line search with a patron. The Center, established in 1975, now performs about 550 on-line searches per month.

The FLP set up the CBIC in 1975 to provide on-line search services. To the sophisticated information consumer of the mid-1980s, on-line searching may seem like old hat, but in 1975 the technology dazzled. *The Philadelphia Inquirer* gushed that thanks to on-line information retrieval, "the FLP can answer almost any question they [patrons] might want to ask. Furthermore, the answers arrive with the speed of the com-

(Continued on Page 2)

In This Issue

☑ **DIALOG Information Services, Inc.**—*Medical Connection, DIALOG OnDisc* CD-ROM products, more full-text databases, the merging of significant files—these are just some of the announcements to come from DIALOG over the past year. If there is a discernable pattern to these new products, services, and innovations, it's that DIALOG is aggressively targeting the end-user market. Its traditional market—librarians and other information professionals—remains well served, however.

☑ **Info Globe**—The U.S. may have *The New York Times* and the *Wall Street Journal*, but Canada has *The Globe and Mail*, which is considered Canada's national newspaper. Info Globe provides on-line access to this paper, offers several other Canadian-oriented files, software packages for use with its financial databases, and a CD-ROM product. In addition to in-depth coverage of the company and its products and services, our *new* report features the results of our hands-on testing of Info Globe's on-line service.

☑ **Chemical Abstracts Service**—Although Chemical Abstracts, producer of the popular *Chemical Abstracts* database, is a nonprofit organization, that doesn't mean it isn't aggressive or that it's reluctant to capitalize on industry trends. Its recent unveiling of a new service on superconductors, which it readied in mere weeks, is a case in point; another is its involvement with STN International (the Scientific and Technical Information Network). STN, which Chemical Abstracts markets in the U.S., now offers more than 30 databases.

☑ **GE Information Services**—This General Electric division boasts the world's largest teleprocessing network. Its GEnie service, which represents the company's first excursion into home computing services, has signed up more than 55,000 subscribers in just over two years—one of the industry's fastest subscription rates. ☐

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Figure 3. The monthly Newsletter included with your subscription is designed to keep you informed of the latest trends, announcements, and developments in the on-line industry.

realize, of course, that you may not always have time to leaf through the entire issue as soon as it's received. By scanning the *In This Issue* section of the newsletter, however, you can pinpoint newly published reports of immediate interest.

On the last page of the newsletter you'll find the *In Future Issues* section. This summarizes particularly significant reports scheduled for publication within the next three months.

The Contents Page

Each volume of the *Datapro Directory of On-line Services* begins with Contents pages located behind the title page (frontispiece) at the front of the binder. Contents pages for both volumes are included, with the Contents page for the volume in hand appearing first. The Contents gives the title of every report and includes page numbers and publication dates. The information is organized in the same sequence as the tab sections and contains the title and starting page number of every report in the service.

The Contents pages are most useful when you have an approximate idea of where something appears in the service. Otherwise, you may want to turn to the indices first. Figure 4 shows a sample Contents page.

Company/Database Index (OL05)

The Company/Database Index (OL05-100-101) is a master index to all the material found in the service. The names of all the companies and databases covered make up the primary entries. Under each *company* entry you may find one or more of the following references:

General services (company) report

Company profile page number

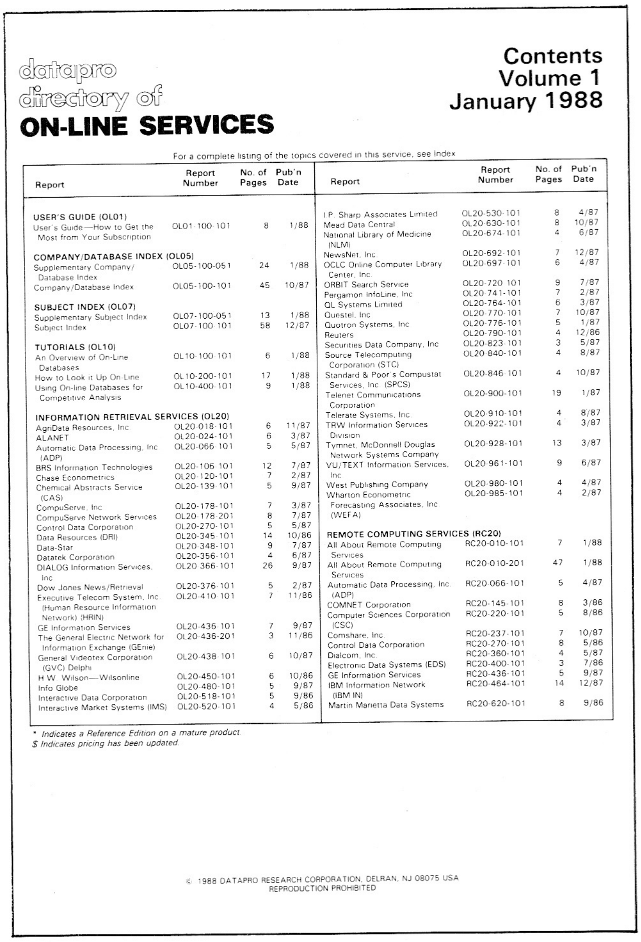
Name and page number of the database(s) associated with the company

Newsletter article references

The Company/Database Index is completely updated every four months and is supplemented in the intervening months by supplementary indices.

Subject Index (OL07)

The Subject Index (OL07-100-101) lists dozens of subject areas, from accounting to zoological research, and the databases associated with each. This index is especially useful when you are looking for databases that cover a particular subject. Listed under each heading are the names of the applicable database(s) and the page number where the database profile appears. The Subject Index, like the Company/Database Index, is updated every four months, and is supplemented in the intervening months by supplementary indices.



datapro
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ON-LINE SERVICES

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Volume 1
January 1988

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GE Information Services	OL20-436-101	7	9/87
The General Electric Network for Information Exchange (GEnie)	OL20-436-201	3	11/86
General Videotex Corporation (GVC) Delphi	OL20-438-101	6	10/87
H.W. Wilson—Wilsonline	OL20-450-101	6	10/86
Info Globe	OL20-480-101	5	9/87
Interactive Data Corporation	OL20-518-101	5	9/86
Interactive Market Systems (IMS)	OL20-520-101	4	5/86
I.P. Sharp Associates Limited	OL20-530-101	8	4/87
Mead Data Central	OL20-630-101	8	10/87
National Library of Medicine (NLM)	OL20-674-101	4	6/87
NewsNet, Inc.	OL20-692-101	7	12/87
OCLC Online Computer Library Center, Inc.	OL20-697-101	6	4/87
ORBIT Search Service	OL20-720-101	9	7/87
Pergamon InfoLine, Inc	OL20-741-101	7	2/87
QL Systems Limited	OL20-764-101	6	3/87
Questel, Inc	OL20-770-101	7	10/87
Quotron Systems, Inc	OL20-776-101	5	1/87
Reuters	OL20-790-101	4	12/86
Securities Data Company, Inc	OL20-823-101	3	5/87
Source Telecomputing Corporation (STC)	OL20-840-101	4	8/87
Standard & Poor's Compustat Services, Inc. (SPCS)	OL20-846-101	4	10/87
Telenet Communications Corporation	OL20-900-101	19	1/87
Telerate Systems, Inc.	OL20-910-101	4	8/87
TRW Information Services Division	OL20-922-101	4	3/87
Tymnet, McDonnell Douglas Network Systems Company	OL20-928-101	13	3/87
VU/TEXT Information Services, Inc	OL20-961-101	9	6/87
West Publishing Company	OL20-980-101	4	4/87
Wharton Econometric Forecasting Associates, Inc (WEFA)	OL20-985-101	4	2/87
REMOTE COMPUTING SERVICES (RC20)			
All About Remote Computing Services	RC20-010-101	7	1/88
All About Remote Computing Services	RC20-010-201	47	1/88
Automatic Data Processing, Inc. (ADP)	RC20-066-101	5	4/87
COMNET Corporation	RC20-145-101	8	3/86
Computer Sciences Corporation (CSC)	RC20-220-101	5	8/86
Comshare, Inc.	RC20-237-101	7	10/87
Control Data Corporation	RC20-270-101	8	5/86
Dialcom, Inc.	RC20-360-101	4	5/87
Electronic Data Systems (EDS)	RC20-400-101	3	7/86
GE Information Services	RC20-436-101	5	9/87
IBM Information Network (IBM IN)	RC20-464-101	14	12/87
Martin Marietta Data Systems	RC20-620-101	8	9/86

* *Indicates a Reference Edition on a mature product.*
$ Indicates pricing has been updated.

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Figure 4. The Contents page is updated with each issue and lists every report in the order in which it appears in the volume. The Contents page is useful for locating specific reports when you have a general idea of their location in the service.

Figure 5 presents a sample page from both the Subject and Company/Database indices.

Tutorials (OL10)

This section includes primer-type reports on the basics of on-line searching. Designed for both novice and more experienced searchers, the reports build on one another, advancing from the general to the very specific. The first report in this tab, "An Overview of Online Databases," introduces the field as a whole. From there, more specific reports appear, such as "How to Look it Up Online."

The reports include examples of on-line searches to bring points home. Taken as a whole, this section provides a short course in the basics of on-line searching.

Information Retrieval Services (OL20)

This tab features detailed company reports that profile specific information retrieval services—primarily database providers (see Figure 1). Each contains the following sections:

User's Guide—How to Get the Most from Your Subscription

- *Company Information*—includes the company's address and telephone number, a *general* overview of the company's history and current product line, and a "Competitive Position" section featuring our insights into the vendor's status within the market.

- *Resources and Facilities*—contains brief descriptions of the vendor's computer processing center, customer support services, and sales and marketing services.

- *Processing Services*—includes any pricing information provided by the vendor.

- *Networking Services*—lists the public networks (e.g., Tymnet, Telenet, etc.) and in some cases, proprietary networks (e.g., DIALNET) that offer access to the vendor's data files.

- *On-line Databases*—provides a listing and brief description of each database the on-line service offers.

- *Other Services*—describes specialized services the company offers that complement its information retrieval service. These may include current awareness services, private networks, CD-ROM products, or descriptions of gateway arrangements the company has made with other database providers.

- *Future Plans*—reports on what new services the vendor is planning for its customers.

Also, each Information Retrieval Services report published since mid-1987 includes a *Hands-On Evaluation* section, set off from the rest of the report in a shaded gray box (see Figure 6). Here, Datapro editors report the results of Hands-On tests of the vendors' on-line services. Following standard criteria, we describe how easy it is to call up a particular vendors' service, what navigating the system is like, what on-line and off-line help is available, and what our overall impressions were. We also include actual screen shots of the welcome screen and of sample searches.

Remote Computing Services (RC20)

This section begins with an in-depth overview of the remote computing industry. This report describes the services remote computing companies offer, how to choose among the various remote computing services, and who the industry's major players are. It also includes comparison columns, which profile more than 400 remote computing companies. Following this report are separate company reports for each of the major remote computing vendors, such as IBM Information Network and GE Information Services.

Profiles (OL30, OL40)

The *Datapro Directory of On-line Services* features two types of profiles: *Company Profiles* and *On-line Database Profiles*. The *Company Profiles* (OL30 Tabs) offer succinctly presented facts on database producers, database providers, and other companies associated with the information retrieval industry. A typical Company Profile contains the following information:

Company name, address, and telephone number
Affiliation with parent company
Principal business
Applications emphasis
President
Director of marketing
Date founded
Number of employees
Revenue for last fiscal year
Primary customers
Sales concentration
Product line

The *On-line Databases* (OL40 Tabs) feature standardized descriptions of more than 2,300 on-line databases. Organized alphabetically by database name, this section provides users the opportunity to compare databases before settling on a particular on-line service. It also enables users to determine if a certain database will meet their needs and to choose from several seemingly similar databases.

Each database profile contains the following information:

Name of database
Name, address, and telephone number of the information retrieval service that offers the database or the database producer
Contact name
Type of organization
Type of database
Frequency of update
Usage and conditions
Typical pricing arrangements
Applications emphasis
Documentation
Service vendor(s)
Database description

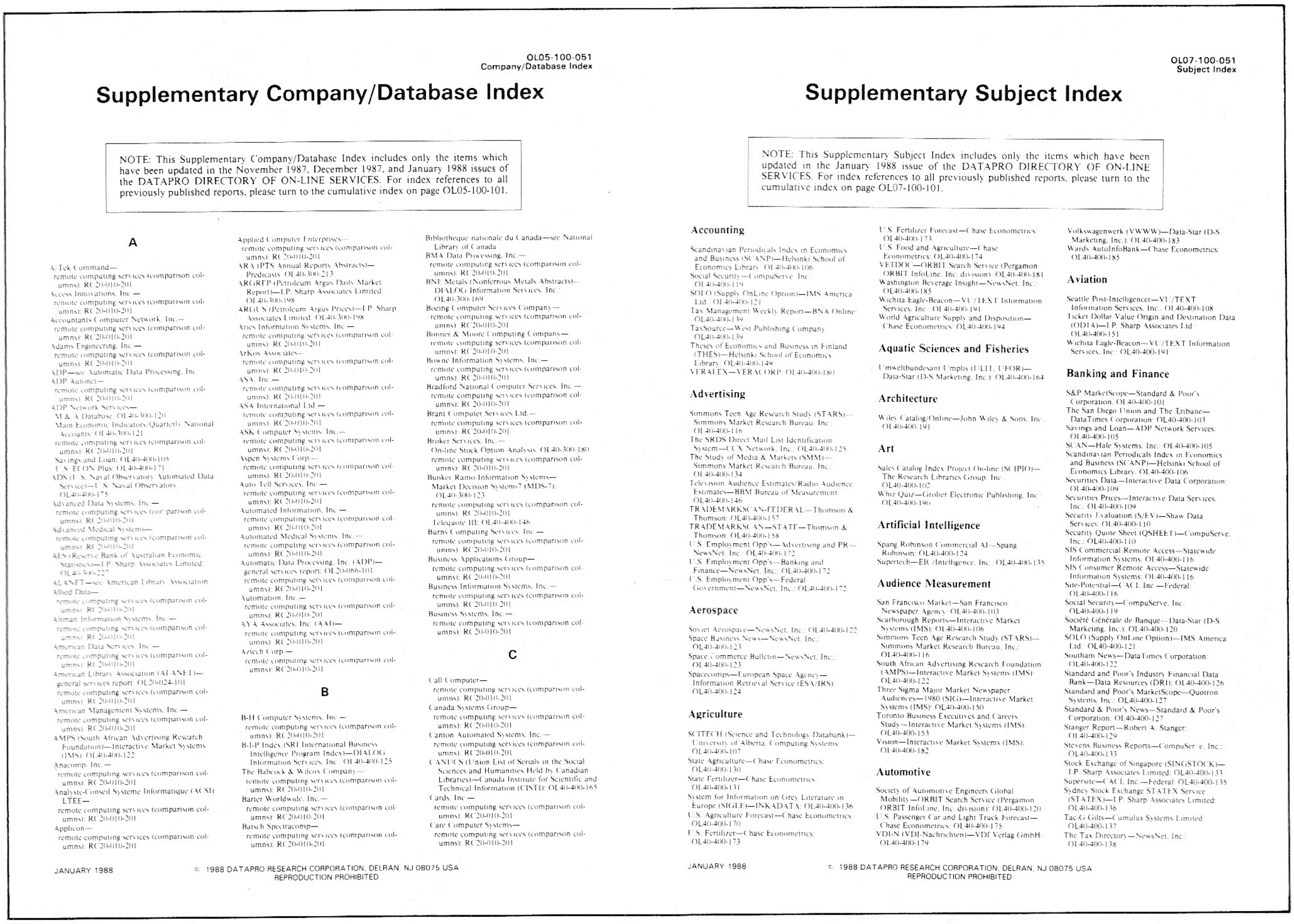
Both the Company and Database profiles are broken down alphabetically (A-C, D-I, J-R, S-Z). There is a separate tab for each segment.

Feature Reports (OL70)

Feature reports (see Figure 7) provide a broad overview of a specific subject area associated with the on-line industry (e.g., modems, microcomputers, videotex services, etc.). They are designed so that, after reviewing the report, the reader will have a solid grounding in the topic covered. Each may contain the following types of information:

- *Tutorial*—a description of the subject's technology, the market, the players within that market, the types of products/services being sold, technological trends, and buyer's guides.

User's Guide—How to Get the Most from Your Subscription



OL05-100-051
Company/Database Index

Supplementary Company/Database Index

NOTE: This Supplementary Company/Database Index includes only the items which have been updated in the November 1987, December 1987, and January 1988 issues of the DATAPRO DIRECTORY OF ON-LINE SERVICES. For index references to all previously published reports, please turn to the cumulative index on page OL05-100-101.

A

- A/Tek Command—
  - remote computing services (comparison columns): RC20-010-201
- Access Innovations, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Accountants Computer Network, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Adams Engineering, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- ADP—see Automatic Data Processing, Inc.
- ADP Autonet—
  - remote computing services (comparison columns): RC20-010-201
- ADP Network Services—
  - M & A Database: OL40-300-120
  - Main Economic Indicators/Quarterly National Accounts: OL40-300-121
  - remote computing services (comparison columns): RC20-010-201
  - Savings and Loan: OL40-400-105
  - U.S. ECON Plus: OL40-400-171
- ADS (U.S. Naval Observatory Automated Data Service)—U.S. Naval Observatory: OL40-400-175
- Advanced Data Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Advanced Medical Systems—
  - remote computing services (comparison columns): RC20-010-201
- AES (Reserve Bank of Australian Economic Statistics)—I.P. Sharp Associates Limited: OL40-300-227
- ALANET—see American Library Association
- Allied Data—
  - remote computing services (comparison columns): RC20-010-201
- Altman Information Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- American Data Services, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- American Library Association (ALANET)—
  - general services report: OL20-024-101
  - remote computing services (comparison columns): RC20-010-201
- American Management Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- AMPS (South African Advertising Research Foundation)—Interactive Market Systems (IMS): OL40-400-122
- Anacomp, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Analyste-Conseil Systeme Informatique (ACSI) LTEE—
  - remote computing services (comparison columns): RC20-010-201
- Applicon—
  - remote computing services (comparison columns): RC20-010-201
- Applied Computer Enterprises—
  - remote computing services (comparison columns): RC20-010-201
- ARA (PTS Annual Reports Abstracts)—Predicasts: OL40-300-213
- ARGREP (Petroleum Argus Daily Market Report)—I.P. Sharp Associates Limited: OL40-300-198
- ARGUS (Petroleum Argus Prices)—I.P. Sharp Associates Limited: OL40-300-198
- Aries Information Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- ArKos Associates—
  - remote computing services (comparison columns): RC20-010-201
- ASA, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- ASA International Ltd.—
  - remote computing services (comparison columns): RC20-010-201
- ASK Computer Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Aspen Systems Corp.—
  - remote computing services (comparison columns): RC20-010-201
- Auto Tell Services, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Automated Information, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Automated Medical Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Automatic Data Processing, Inc. (ADP)—
  - general services report: OL20-066-101
  - remote computing services (comparison columns): RC20-010-201
- Automation, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- AYA Associates, Inc. (AAI)—
  - remote computing services (comparison columns): RC20-010-201
- Aztech Corp.—
  - remote computing services (comparison columns): RC20-010-201

B

- B-H Computer Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- B-I-P Index (SRI International Business Intelligence Program Index)—DIALOG Information Services, Inc.: OL40-400-125
- The Babcock & Wilcox Company—
  - remote computing services (comparison columns): RC20-010-201
- Barter Worldwide, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Batsch Spectracomp—
  - remote computing services (comparison columns): RC20-010-201
- Bibliotheque nationale du Canada—see National Library of Canada
- BMA Data Processing, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- BNF Metals (Nonferrous Metals Abstracts)—DIALOG Information Services, Inc.: OL40-300-169
- Boeing Computer Services Company—
  - remote computing services (comparison columns): RC20-010-201
- Bonner & Moore Computing Company—
  - remote computing services (comparison columns): RC20-010-201
- Bowne Information Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Bradford National Computer Services, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Brant Computer Services Ltd.—
  - remote computing services (comparison columns): RC20-010-201
- Broker Services, Inc.—
  - On-line Stock Option Analysis: OL40-300-180
  - remote computing services (comparison columns): RC20-010-201
- Bunker Ramo Information Systems—
  - Market Decision System-7 (MDS-7): OL40-300-123
  - remote computing services (comparison columns): RC20-010-201
  - Telequote III: OL40-400-146
- Burns Computing Services, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Business Applications Group—
  - remote computing services (comparison columns): RC20-010-201
- Business Information Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Business Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201

C

- Call Computer—
  - remote computing services (comparison columns): RC20-010-201
- Canada Systems Group—
  - remote computing services (comparison columns): RC20-010-201
- Canton Automated Systems, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- CANUCS (Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-165
- Cards, Inc.—
  - remote computing services (comparison columns): RC20-010-201
- Care Computer Systems—
  - remote computing services (comparison columns): RC20-010-201

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OL07-100-051
Subject Index

Supplementary Subject Index

NOTE: This Supplementary Subject Index includes only the items which have been updated in the January 1988 issue of the DATAPRO DIRECTORY OF ON-LINE SERVICES. For index references to all previously published reports, please turn to the cumulative index on page OL07-100-101.

Accounting

- Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-106
- Social Security—CompuServe, Inc.: OL40-400-119
- SOLO (Supply OnLine Option)—IMS America Ltd.: OL40-400-121
- Tax Management Weekly Report—BNA Online: OL40-400-139
- TaxSource—West Publishing Company: OL40-400-139
- Theses of Economics and Business in Finland (THES)—Helsinki School of Economics Library: OL40-400-149
- VERALEX—VERACORP: OL40-400-180

Advertising

- Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-116
- The SRDS Direct Mail List Identification System—CCX Network, Inc.: OL40-400-125
- The Study of Media & Markets (SMM)—Simmons Market Research Bureau, Inc.: OL40-400-134
- Television Audience Estimates/Radio Audience Estimates—BBM Bureau of Measurement: OL40-400-146
- TRADEMARKSCAN-FEDERAL—Thomson & Thomson: OL40-400-157
- TRADEMARKSCAN—STATE—Thomson & Thomson: OL40-400-158
- U.S. Employment Opp's—Advertising and PR—NewsNet, Inc.: OL40-400-172
- U.S. Employment Opp's—Banking and Finance—NewsNet, Inc.: OL40-400-172
- U.S. Employment Opp's—Federal Government—NewsNet, Inc.: OL40-400-172

Aerospace

- Soviet Aerospace—NewsNet, Inc.: OL40-400-122
- Space Business News—NewsNet, Inc.: OL40-400-123
- Space Commerce Bulletin—NewsNet, Inc.: OL40-400-123
- Spacecomps—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-400-124

Agriculture

- SCITECH (Science and Technology Databank)—University of Alberta, Computing Systems: OL40-400-107
- State Agriculture—Chase Econometrics: OL40-400-130
- State Fertilizer—Chase Econometrics: OL40-400-131
- System for Information on Grey Literature in Europe (SIGLE)—INKADATA: OL40-400-136
- U.S. Agriculture Forecast—Chase Econometrics: OL40-400-170
- U.S. Fertilizer—Chase Econometrics: OL40-400-173
- U.S. Fertilizer Forecast—Chase Econometrics: OL40-400-173
- U.S. Food and Agriculture—Chase Econometrics: OL40-400-174
- VETDOC—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-181
- Washington Beverage Insight—NewsNet, Inc.: OL40-400-185
- Wichita Eagle-Beacon—VU/TEXT Information Services, Inc.: OL40-400-191
- World Agriculture Supply and Disposition—Chase Econometrics: OL40-400-194

Aquatic Sciences and Fisheries

- Umweltbundesant Umplis (ULIT, UFOR)—Data-Star (D-S Marketing, Inc.): OL40-400-164

Architecture

- Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-191

Art

- Sales Catalog Index Project On-line (SCIPIO)—The Research Libraries Group, Inc.: OL40-400-102
- Whiz Quiz—Grolier Electronic Publishing, Inc.: OL40-400-190

Artificial Intelligence

- Spang Robinson Commercial AI—Spang Robinson: OL40-400-124
- Supertech—EIC/Intelligence, Inc.: OL40-400-135

Audience Measurement

- San Francisco Market—San Francisco Newspaper Agency: OL40-400-103
- Scarborough Reports—Interactive Market Systems (IMS): OL40-400-106
- Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-116
- South African Advertising Research Foundation (AMPS)—Interactive Market Systems (IMS): OL40-400-122
- Three Sigma Major Market Newspaper Audiences—1980 (SIG)—Interactive Market Systems (IMS): OL40-400-150
- Toronto Business Executives and Careers Study—Interactive Market Systems (IMS): OL40-400-153
- Vision—Interactive Market Systems (IMS): OL40-400-182

Automotive

- Society of Automotive Engineers Global Mobility—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-120
- U.S. Passenger Car and Light Truck Forecast—Chase Econometrics: OL40-400-175
- VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-179
- Volkswagenwerk (VWWW)—Data-Star (D-S Marketing, Inc.): OL40-400-183
- Wards AutoInfoBank—Chase Econometrics: OL40-400-185

Aviation

- Seattle Post-Intelligencer—VU/TEXT Information Services, Inc.: OL40-400-108
- Ticket Dollar Value Origin and Destination Data (ODIA)—I.P. Sharp Associates Ltd.: OL40-400-151
- Wichita Eagle-Beacon—VU/TEXT Information Services, Inc.: OL40-400-191

Banking and Finance

- S&P MarketScope—Standard & Poor's Corporation: OL40-400-101
- The San Diego Union and The Tribune—DataTimes Corporation: OL40-400-103
- Savings and Loan—ADP Network Services: OL40-400-105
- SCAN—Hale Systems, Inc.: OL40-400-105
- Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-106
- Securities Data—Interactive Data Corporation: OL40-400-109
- Securities Prices—Interactive Data Services, Inc.: OL40-400-109
- Security Evaluation (S/EV)—Shaw Data Services: OL40-400-110
- Security Quote Sheet (QSHEET)—CompuServe, Inc.: OL40-400-110
- SIS Commercial Remote Access—Statewide Information Systems: OL40-400-116
- SIS Consumer Remote Access—Statewide Information Systems: OL40-400-116
- Site-Potential—CACI, Inc.—Federal: OL40-400-116
- Social Security—CompuServe, Inc.: OL40-400-119
- Société Générale de Banque—Data-Star (D-S Marketing, Inc.): OL40-400-120
- SOLO (Supply OnLine Option)—IMS America Ltd.: OL40-400-121
- Southam News—DataTimes Corporation: OL40-400-122
- Standard and Poor's Industry Financial Data Bank—Data Resources (DRI): OL40-400-126
- Standard and Poor's MarketScope—Quotron Systems, Inc.: OL40-400-127
- Standard & Poor's News—Standard & Poor's Corporation: OL40-400-127
- Stanger Report—Robert A. Stanger: OL40-400-129
- Stevens Business Reports—CompuServe, Inc.: OL40-400-133
- Stock Exchange of Singapore (SINGSTOCK)—I.P. Sharp Associates Limited: OL40-400-133
- Supersite—CACI, Inc.—Federal: OL40-400-135
- Sydney Stock Exchange STATEX Service (STATEX)—I.P. Sharp Associates Limited: OL40-400-136
- Tac-G Gilts—Cumulus Systems Limited: OL40-400-137
- The Tax Directory—NewsNet, Inc.: OL40-400-138

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Figure 5. The Indices are used to locate all references to a specific company, database, or subject area in the service. Report page numbers are provided for easy lookup.

- *Vendors and Suppliers*—the names and addresses of companies that sell products in the specified technology field.

- *Comparison Columns*—columnar listings of specifications and pricing for all products/services sold in the specified subject area. These columns are organized alphabetically by vendor and are designed for quick, consistent reference from column to column.

Glossary (OL90)

The glossary defines more than 300 on-line, data communications, and telecommunications terms.

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User's Guide—How to Get the Most from Your Subscription

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- Publish reports with the highest level of quality and timeliness possible.

- Support and develop the strongest editorial and technical team in our industry.

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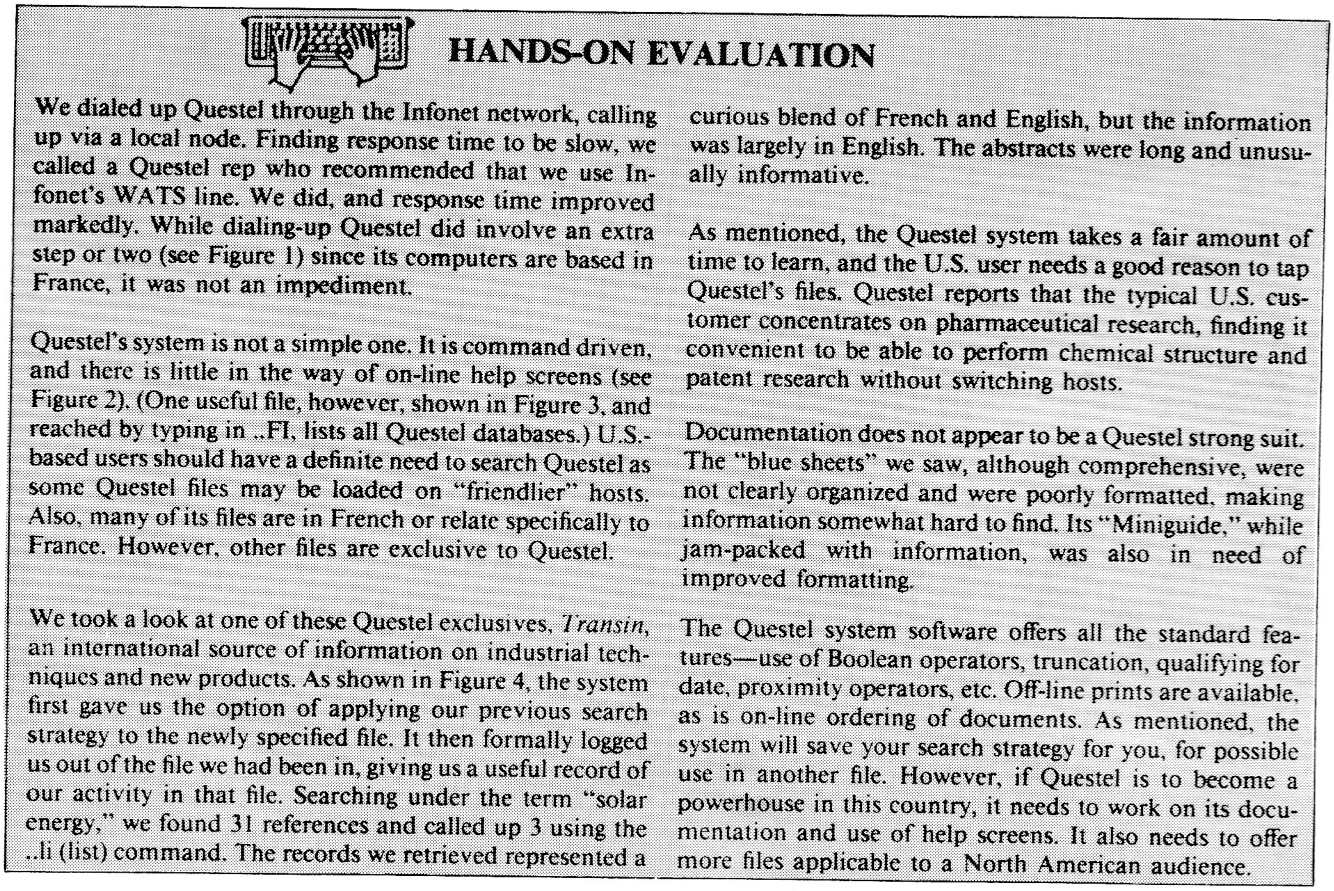


HANDS-ON EVALUATION

We dialed up Questel through the Infonet network, calling up via a local node. Finding response time to be slow, we called a Questel rep who recommended that we use Infonet's WATS line. We did, and response time improved markedly. While dialing-up Questel did involve an extra step or two (see Figure 1) since its computers are based in France, it was not an impediment.

Questel's system is not a simple one. It is command driven, and there is little in the way of on-line help screens (see Figure 2). (One useful file, however, shown in Figure 3, and reached by typing in ..FI, lists all Questel databases.) U.S.-based users should have a definite need to search Questel as some Questel files may be loaded on "friendlier" hosts. Also, many of its files are in French or relate specifically to France. However, other files are exclusive to Questel.

We took a look at one of these Questel exclusives, *Transin*, an international source of information on industrial techniques and new products. As shown in Figure 4, the system first gave us the option of applying our previous search strategy to the newly specified file. It then formally logged us out of the file we had been in, giving us a useful record of our activity in that file. Searching under the term "solar energy," we found 31 references and called up 3 using the ..li (list) command. The records we retrieved represented a curious blend of French and English, but the information was largely in English. The abstracts were long and unusually informative.

As mentioned, the Questel system takes a fair amount of time to learn, and the U.S. user needs a good reason to tap Questel's files. Questel reports that the typical U.S. customer concentrates on pharmaceutical research, finding it convenient to be able to perform chemical structure and patent research without switching hosts.

Documentation does not appear to be a Questel strong suit. The "blue sheets" we saw, although comprehensive, were not clearly organized and were poorly formatted, making information somewhat hard to find. Its "Miniguide," while jam-packed with information, was also in need of improved formatting.

The Questel system software offers all the standard features—use of Boolean operators, truncation, qualifying for date, proximity operators, etc. Off-line prints are available, as is on-line ordering of documents. As mentioned, the system will save your search strategy for you, for possible use in another file. However, if Questel is to become a powerhouse in this country, it needs to work on its documentation and use of help screens. It also needs to offer more files applicable to a North American audience.

Figure 6. The Hands-On Evaluation section, included in company reports published since mid-1987, present the results of our editors' evaluation of the particular on-line service. It's here that our impressions of the service, from logon to logoff, are recounted.

User's Guide—How to Get the Most from Your Subscription

HOW TO FIND FACTS FAST!

1. *Use the* ***Indices*** to locate the page number of a report covering an information retrieval service, remote computing service, database producer, database, or specific subject area of interest. This is where you start when you do not know where the information might be located in the service or are unfamiliar with the product area. The Indices will direct you to all the reports and profiles in the service and provide you with the widest choice of places to begin your research.

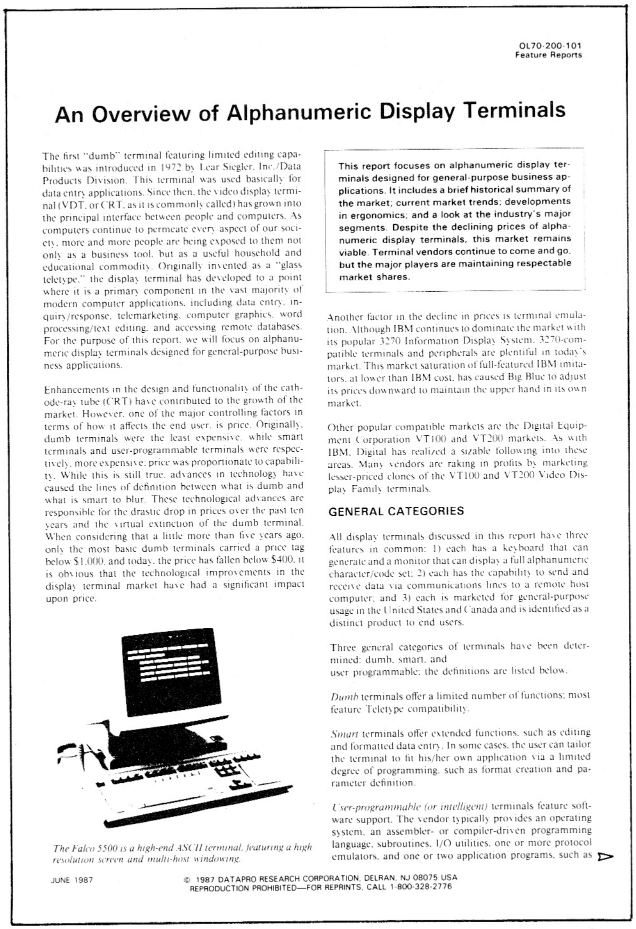
2. *Use the* ***Contents*** *page* to quickly locate a specific report when you know in which volume of the service it is found. The Contents is also handy for browsing among the titles found in the service.

3. In trying to narrow your information retrieval, database selection, or remote computing services down to a select few, use the following approach:

   Step 1. *Scan through the* ***Company*** *and* ***On-line Database Profiles***. These provide information on the dozens of information retrieval services, hundreds of database producers, and more than 2,000 databases that make up the on-line industry. Similarly, to review the characteristics of hundreds of remote computing services, turn to the comparison columns following the first report behind Tab RC20.

   Step 2. *Read Datapro's detailed* ***Company Reports*** (in Tabs OL20 and RC20) on each of the information retrieval and remote computing services you have identified. These reports will provide you with the opinion and support you need to recognize the advantages and restrictions of a particular service and its offerings for your application.

4. *Use the* ***Newsletter*** to stay on top of current events in the industry, whether these involve new product introductions, technological breakthroughs, or market trends.



OL70-200-101
Feature Reports

An Overview of Alphanumeric Display Terminals

The first "dumb" terminal featuring limited editing capabilities was introduced in 1972 by Lear Siegler, Inc./Data Products Division. This terminal was used basically for data entry applications. Since then, the video display terminal (VDT, or CRT, as it is commonly called) has grown into the principal interface between people and computers. As computers continue to permeate every aspect of our society, more and more people are being exposed to them not only as a business tool, but as a useful household and educational commodity. Originally invented as a "glass teletype," the display terminal has developed to a point where it is a primary component in the vast majority of modern computer applications, including data entry, inquiry/response, telemarketing, computer graphics, word processing/text editing, and accessing remote databases. For the purpose of this report, we will focus on alphanumeric display terminals designed for general-purpose business applications.

Enhancements in the design and functionality of the cathode-ray tube (CRT) have contributed to the growth of the market. However, one of the major controlling factors in terms of how it affects the end user, is price. Originally, dumb terminals were the least expensive, while smart terminals and user-programmable terminals were respectively, more expensive; price was proportionate to capability. While this is still true, advances in technology have caused the lines of definition between what is dumb and what is smart to blur. These technological advances are responsible for the drastic drop in prices over the past ten years and the virtual extinction of the dumb terminal. When considering that a little more than five years ago, only the most basic dumb terminals carried a price tag below $1,000, and today, the price has fallen below $400, it is obvious that the technological improvements in the display terminal market have had a significant impact upon price.

The Falco 5500 is a high-end ASCII terminal, featuring a high resolution screen and multi-host windowing.

This report focuses on alphanumeric display terminals designed for general-purpose business applications. It includes a brief historical summary of the market; current market trends; developments in ergonomics; and a look at the industry's major segments. Despite the declining prices of alphanumeric display terminals, this market remains viable. Terminal vendors continue to come and go, but the major players are maintaining respectable market shares.

Another factor in the decline in prices is terminal emulation. Although IBM continues to dominate the market with its popular 3270 Information Display System, 3270-compatible terminals and peripherals are plentiful in today's market. This market saturation of full-featured IBM imitators, at lower than IBM cost, has caused Big Blue to adjust its prices downward to maintain the upper hand in its own market.

Other popular compatible markets are the Digital Equipment Corporation VT100 and VT200 markets. As with IBM, Digital has realized a sizable following into these areas. Many vendors are raking in profits by marketing lesser-priced clones of the VT100 and VT200 Video Display Family terminals.

GENERAL CATEGORIES

All display terminals discussed in this report have three features in common: 1) each has a keyboard that can generate and a monitor that can display a full alphanumeric character/code set; 2) each has the capability to send and receive data via communications lines to a remote host computer; and 3) each is marketed for general-purpose usage in the United States and Canada and is identified as a distinct product to end users.

Three general categories of terminals have been determined: dumb, smart, and
user programmable; the definitions are listed below.

Dumb terminals offer a limited number of functions; most feature Teletype compatibility.

Smart terminals offer extended functions, such as editing and formatted data entry. In some cases, the user can tailor the terminal to fit his/her own application via a limited degree of programming, such as format creation and parameter definition.

User-programmable (or intelligent) terminals feature software support. The vendor typically provides an operating system, an assembler- or compiler-driven programming language, subroutines, I/O utilities, one or more protocol emulators, and one or two application programs, such as ▷

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Figure 7. Feature Reports provide a complete overview of an important technology or product category in the industry. They contain a tutorial on the technology, guidelines for selecting equipment, and the names and addresses of vendors in the field. Some also include detailed comparison columns for all known products. Feature Reports are typically used when searching for particular products that will suit a need or to gain a firm grounding in a technology of interest.

updated with fresh new ideas and analysis on an ongoing basis. Each component and feature of the service is designed to maximize the benefits you receive from your subscription.

Responding to the Industry

It takes over 35 individual loose-leaf services for Datapro to report adequately on the many separate segments of the information technology market. The range of coverage required is staggering. We must follow tens of thousands of products offered by more than 20,000 individual vendors.

Datapro continually tracks industry events and needs through an ongoing variety of programs:

- Our Editorial Charter encourages each of our editors to maintain close contact with the users and the industry, ensuring that our reports contain meaningful commentary and analysis, and guaranteeing the superior responsiveness of all Datapro services.
- *Advisory Boards* of industry practitioners give us realistic overviews, advice, and opinions about each of our services. They assist us in evaluating the quality of our services on a monthly basis.

THE DATAPRO PRODUCT FAMILY

Each type of Datapro service is designed to be an integral part of a "cluster" of publications covering a specific market segment. The publications are designed so that one type complements another. Together, two or three types of Datapro products will comprise our total product line for a given market segment. *Datapro Directory of On-line Services* is part of the "communications cluster," which also includes the following reports:

User's Guide—How to Get the Most from Your Subscription

- *Datapro Management of Data Communications*—contains articles about managing the data communications network.
- *Datapro Reports on Data Communications*—contains feature reports, comparison columns, and product reports on major, large-scale data communications products and services.
- *Datapro Reports on Telecommunications*—contains feature reports, comparison columns, and product reports on major voice products and services.
- *Datapro Management of Telecommunications*—contains articles about telecommunications management issues.
- *Datapro Reports on Communications Alternatives*—covers transmission techniques and products associated with fiber optic, satellite, microwave, and T-carrier systems.
- *Datapro Reports on PC Communications*—contains feature reports, comparison columns, product reports, and "hands-on" evaluations of important PC communications equipment.

The individual services can be used separately, but together this combination of hardware, software, and management information provides the decision maker with the kind of total resource that is needed to run an information technology operation.

In addition to the above titles, Datapro also publishes the following information services:

INFORMATION PROCESSING
Datapro 70
Datapro 70 International
Reports on Minicomputers
Reports on Information Security
Reports on Software
Reports on Software International
Directory of Software
Management of Applications Software
Management of EDP Systems

MICROCOMPUTERS
Reports on Microcomputers
Reports on Microcomputers International
Management of Microcomputer Systems
Reports on PC Communications
Directory of Microcomputer Software
Directory of Microcomputer Hardware

OFFICE AUTOMATION
Reports on Office Automation
Reports on Office Automation International
Management of Office Automation
Reports on Word Processing
Reports on Word Processing International
Reports on Copiers & Duplicators
Reports on Electronic Publishing Systems

INDUSTRY AUTOMATION
Reports on Banking Automation
Reports on Retail Automation
Manufacturing Automation Series
  Management and Planning
  Manufacturing Information Systems
  CAD/CAM/CAE Systems
  Factory Automation
  News and Perspectives

Vendor Information Services provide third-party, nonbiased research data that can be tailored to suit an organization's needs. This highly customized information—available from the entire contents of the Datapro and Future Computing databases—includes the following products and services: Electronic Database Services; Custom Publishing and Market Research; Competitive Handbooks; Future Computing Incorporated—micro/PC hardware and software testing, and market/distribution channel analysis; On-Site Educational Services; and Reprints and Feature Reports.

NOW IT'S UP TO YOU

The basic goal of this—or any other—conscientious information service is to synthesize all the data available about a selected topic into a comprehensive, orderly structure that is timely, accurate, and easy to use. The *Datapro Directory of On-line Services* is far more than a simple reference book. It is a continuously updated *information service* that is constantly refreshed to be of ongoing value to professionals of many sorts—librarians; information specialists; writers, editors, and others with ongoing research needs; managers; competitive analysts; market researchers; advertising executives; and everyone else who uses on-line services.

Now it is up to you. Put the service to work and give yourself the chance to find out how valuable it can be! □

Supplementary Company/Database Index

NOTE: This Supplementary Company/Database Index includes only the items which have been updated in the June 1989 and July 1989 issues of Volume 1 of the DATAPRO DIRECTORY OF ON-LINE SERVICES. For index references to all previously published reports, please turn to the cumulative index on page OL05-100-101.

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- Alberta Bureau of Statistics—
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- SEB (Software Engineering Bibliographic)—Data & Analysis Center for Software: OL40-400-202
- Sell Business Opportunities (SELL)—Data-Star (D-S Marketing, Inc.): OL40-400-201
- Sexual Harassment: Employer Policies and Problems—Executive Telecom System, Inc.: OL40-400-201
- I.P. Sharp Associates Ltd. (A Reuter Company)—
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  - company profile: OL30-400-131
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TRADEMARKSCAN—STATE—Thomson & Thomson: OL40-400-205
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D

DOE (United States Department of Energy)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-144

E

ED THESIS (Theses in Education)—University of Alberta, Computing Systems: OL40-400-132

H

HEATW (United States Weekly Temperatures)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-146

I

INS (United States International Air Travel Statistics)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-144

P

PJB Publications Ltd.—
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S Corporation Planning Alert—NewsNet, Inc.: OL40-400-101
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- SDI Intelligence Report (formerly Star Wars Intelligence Report)—NewsNet, Inc.: OL40-400-105
- SDI Monitor (Strategic Defense Initiative)—NewsNet, Inc.: OL40-400-105
- SDILINE (Selective Dissemination of Information On-line)—National Library of Medicine (NLM): OL40-400-107
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- SDIM1 (System for Documentation and Information in Metallurgy)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
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CRIS/USDA (Current Research Information System)—U.S. Department of Agriculture: OL40-100-222
Cronos—The WEFA Group: OL40-100-222
CRR (Canadian Regulatory Reporter)—Canadian Law Information Council: OL40-100-175
CRT (Central Register of Last Wills)—Credoc A.S.B.L.: OL40-100-185
CRYSTOR (Cambridge Crystallographic)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-169
CSA Certified Products Data Base (CPD)—QL Systems Ltd.: OL40-100-222
CSC—see Computer Sciences Corp.
CSCHEM—STN International (The Scientific and Technical Information Network): OL40-100-222
CSCORP—STN International (The Scientific and Technical Information Network): OL40-100-223
CSI—see Capitol Services, Inc.
CSW (Computer Sports World)—Computer Sports World, Inc.: OL40-100-213
CT (Chemical Titles)—Chemical Abstracts Service: OL40-100-193
CTCP (Clinical Toxicology of Commercial Products)—Chemical Information Systems, Inc.: OL40-100-201
CTDS (Canadian Transportation Documentation System)—Transport Canada Library and Information Centre: OL40-100-176
C3I Report—NewsNet, Inc.: OL40-100-223
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  company profile: OL30-100-148—Current Technology Index (CTI)—Library Association Publishing Ltd.: OL40-100-225
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Datapress, Inc.—
  company profile: OL30-200-143
DGRF (ACS Directory of Graduate Research)—BRS Information Technologies: OL40-100-105
DMS Contract Awards—DIALOG Information Services, Inc.: OL40-200-245
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DMS Defense Newsletters—DIALOG Information Services, Inc.: OL40-200-245
DMS Market Intelligence Reports—DIALOG Information Services, Inc.: OL40-200-245
DOIDB (Canadian Department of Insurance)—I.P. Sharp Associates Limited: OL40-100-172
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DRI U.S. County Data Bank—Data Resources (DRI): OL40-200-247

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Editorial Expertise, Inc.—
  company profile: OL30-200-143
Education Daily—NewsNet, Inc.: OL40-200-247
Education of the Handicapped—NewsNet, Inc.: OL40-200-247
EEO Policies and Programs—Executive Telecom System, Inc.: OL40-200-247
Electronic Information Series—D.A.T.A., Inc.: OL40-200-247
Employment Guide Newsletter—Executive Telecom System, Inc.: OL40-200-248
Energy Bibliography—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-200-248

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Engineered Materials Abstracts—DIALOG Information Services, Inc.: OL40-200-248
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FMD (Financial Management Database)—Proprietary Computer Systems, Inc. (PCS): OL40-200-249
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Gannett News Service—DataTimes Corporation: OL40-200-249
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George Mason University Public Choice Center—company profile: OL30-200-144
Government Training News—Executive Telecom System, Inc.: OL40-200-250
Ground Water Monitor—NewsNet, Inc.: OL40-200-250

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HAZE (Alcohol Use/Abuse)—BRS Information Technologies: OL40-100-117
Health Care Costs: Where's the Bottom Line?—Executive Telecom System, Inc.: OL40-200-250
Health Industry Research Reports (HIRR)—BRS Information Technologies: OL40-200-250
Hotline—RCA Global Communications, Inc. (RCA Globcom): OL40-200-250
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ICC-E—IST-Informatheque, Inc.: OL40-200-250
IEA Coal—QL Systems Ltd.: OL40-200-250
Immigration Reform: A Practical Guide—Executive Telecom System, Inc.: OL40-200-250
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IREL (Australian Industrial Relations)—Brisbane CAE Resource Center: OL40-100-139

J

Journal of Commerce—company profile: OL30-300-139
JSCHEDULE (Canadian Chartered Banks, Monthly Statements of Assets and Liabilities)—I.P. Sharp Associates Limited: OL40-100-171
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K

KIPD (Knowledge Industries Publications Database)—BRS Information Technologies: OL40-300-235
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OEES (Austrian Energy Consumption Statistics)—I.P. Sharp Associates Limited: OL40-100-141
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PPCT (Patent Online System—PCT Applications)—Bertelsmann Informations Service GmbH: OL40-300-237
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Resource—Executive Telecom System, Inc.: OL40-300-239
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SCIPIO (Arts Sales Catalog Database)—The Research Libraries Group, Inc.: OL40-100-133

T

The Permanent Inventory of Agricultural Research Projects (AGREP)—I/S Datacentralen: OL40-100-110
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T9S (Combined T9/Service Segment Traffic Statistics)—I.P. Sharp Associates Limited: OL40-100-205

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USNI Military Database—Military Data Corporation: OL40-400-205

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And Agriculture

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The National Report on Work & Family—Executive Telecom System, Inc.: OL40-400-204

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Bibliographic Research

BNBMARC—British Library Bibliographic Services: OL40-100-227
Cartographic Materials—British Library Bibliographic Services: OL40-100-229
Science Reference and Information Service Catalogue (SRIS)—British Library Bibliographic Services: OL40-400-104

Billing/Invoicing/Collection

TRW Credit Data Division—TRW Credit Data Division: OL40-400-139

Biology

SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109

Biomedical Research Information

Selective Dissemination of Information On-line (SDILINE)—National Library of Medicine (NLM): OL40-400-107

Supplementary Subject Index

SERials on-LINE (SERLINE)—National Library of Medicine (NLM): OL40-400-108
TOXicology LITerature from Special Sources (TOXLIT)—National Library of Medicine (NLM): OL40-400-134

Biotechnology Related Information

Supertech—Bowker Electronic Publishing: OL40-400-123
Telegenline—Bowker Electronic Publishing: OL40-400-129

Broadcasting

South African Focus—NewsNet, Inc.: OL40-400-114
South Scan—NewsNet, Inc.: OL40-400-114
Sports Illustrated—VU/TEXT Information Services, Inc.: OL40-400-116

Business and Strategic Planning

Trinet Database of U.S. Business Information—Trinet, Inc.: OL40-400-138

Business Purchase Decisions

Top Management Insights—Simmons Market Research Bureau, Inc.: OL40-400-133

Business Related Database Categories

Compustat Industrial—ADP Data Services: OL40-100-230
Site-Potential—Technical Data International: OL40-400-110
The Small Business Tax Review—Hooksett Publishing Inc.: OL40-400-111
Software (SOFT)—Data-Star (D-S Marketing, Inc.): OL40-400-113
SRI International Business Intelligence Program Index (B-I-P Index)—DIALOG Information Services, Inc.: OL40-400-116
Standard & Poor's News—Standard & Poor's Corporation: OL40-400-117
Standard & Poor's Register—Corporate—Standard & Poor's Corporation: OL40-400-117
Standard & Poor's Register—Biographical—Standard & Poor's Corporation: OL40-400-117
TED (Tenders Electronic Daily)—European Commission Host Organisation (ECHO): OL40-400-128
Telexport (TXPY)—Chambre de Commerce et D'Industrie: OL40-400-130
Textline—Reuters U.S. Inc.: OL40-400-131
Thomas Register Online—DIALOG Information Services, Inc.: OL40-400-132
Toronto Business Executives and Careers Study—Interactive Market Systems, Inc. (IMS): OL40-400-134
Trade & Industry ASAP—Information Access Company: OL40-400-135
Trade and Industry Index (TI)—Information Access Company: OL40-400-135
TRADEMARKSCAN-FEDERAL—Thomson & Thomson: OL40-400-136
TRADEMARKSCAN—STATE—Thomson & Thomson: OL40-400-136
United Press International (UPI)—NewsNet, Inc.: OL40-400-144
Update/The American States—Update/The American States: OL40-400-146
WARNDEX (Wall Street Transcript)—VU/TEXT Information Services, Inc.: OL40-400-153
Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-157
World Affairs Report—California Institute of International Studies: OL40-400-158

Census and Utilization Review

Site—Thomson Financial Networks: OL40-400-110
Supersite—Technical Data International: OL40-400-123

Chemicals

State Regulation Report: Toxics (SRR)—NewsNet, Inc.: OL40-400-121
THERMODATA—THERMODATA: OL40-400-132
Toxic Chemical Release Inventory (TRI)—National Library of Medicine (NLM): OL40-400-134
Toxic Materials Transport—NewsNet, Inc.: OL40-400-134
TSCATS (TSCA Test Submissions)—Chemical Information Systems, Inc.: OL40-400-139
VtB (Verfahrenstechnische Berichte)—STN International (The Scientific and Technical Information Network): OL40-400-153

Chemistry

Cambridge Structural Database (CSD)—Cambridge Crystallographic Data Centre: OL40-100-228
Suspect Chemicals Sourcebook (SUSPECT)—Chemical Information Systems, Inc.: OL40-400-123
Wiley Mass Spectral Search System (WMSSS)—Chemical Information Systems, Inc.: OL40-400-157

Chemistry Related Information

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109
State Regulation Report: Toxics (SRR)—NewsNet, Inc.: OL40-400-121
Structure and Nomenclature Search System (SANSS)—Chemical Information Systems, Inc.: OL40-400-122
Thermo—Chemical Information Systems, Inc.: OL40-400-132
THERMODATA—THERMODATA: OL40-400-132
TRC Vapor Pressure Datafile—Technical Database Services, Inc.: OL40-400-138
TSCA Chemical Substances Inventory—DIALOG Information Services, Inc.: OL40-400-139
TSCA Plant and Production (TSCAPP)—Chemical Information Systems, Inc.: OL40-400-139
TSCATS (TSCA Test Submissions)—Chemical Information Systems, Inc.: OL40-400-139
Umweltbundesant Umplis (ULIT, UFOR)—Data-Star (D-S Marketing, Inc.): OL40-400-142
VtB (Verfahrenstechnische Berichte)—STN International (The Scientific and Technical Information Network): OL40-400-153
Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-157
World Petrochemicals Program (WP DATA)—SRI International: OL40-400-160

Civil Engineering

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230

Commodities

Securities Industry Database—DRI/McGraw-Hill: OL40-400-106
Telequote III—Bunker Ramo Information Systems: OL40-400-130
The Tradeline Service—Wellington Financial Corporation: OL40-400-135
United Nations Commodity Trade Statistics (SITC)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-143
United States Producer Price Index (USPPI)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-145
The Wellington Letter—Wellington Financial Corporation: OL40-400-155
Wellington's Special Bulletin Service—Wellington Financial Corporation: OL40-400-155

Communications

SAA Age--An Inside Look at IBM—NewsNet, Inc.: OL40-400-101
SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109
SOLIS (Social Sciences Literature Information System)—STN International (The Scientific and Technical Information Network): OL40-400-114
Telecommunications Reports—NewsNet, Inc.: OL40-400-129
Trading Systems Technology—NewsNet, Inc.: OL40-400-136

Computer Related Information

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Seybold Outlook:Professional Computing—NewsNet, Inc.: OL40-400-108
Tech Extra (TE)—Electronet Information Systems, Inc.: OL40-400-127
Technical Computing—NewsNet, Inc.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Technology Watch (TW)—Electronet Information Systems, Inc.: OL40-400-128
U.S. Employment Opportunities—The Computer Field—NewsNet, Inc.: OL40-400-147
The Videodisc Monitor—NewsNet, Inc.: OL40-400-152
World of Lotus—CompuServe: OL40-400-159

Computer Science

Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-157

Conferences/Shows

Seminar Clearinghouse Database—Executive Telecom System, Inc.: OL40-400-107

Construction

SIAO—PRIMA TELEMATIC, INC.: OL40-400-109

Supplementary Subject Index

SiteNet—Conway Data, Inc.: OL40-400-110
SMSA Building Permits—The WEFA Group: OL40-400-111
VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150

Consulting

The Satellite Directory—NewsNet, Inc.: OL40-400-103
The Telephone Industry Directory—NewsNet, Inc.: OL40-400-129
Training and Development Programs (A BNA Survey and Special Report)—BNA Online: OL40-400-136

Consumer and Market Research

Cambridge Reports—Trends & Forecasts—NewsNet, Inc.: OL40-100-228
Teenage Media/Market Study—Teenage Research Unlimited: OL40-400-128
10 Mediamarkets—Mediamark Research Inc.: OL40-400-130
Upper Deck—Mediamark Research Inc.: OL40-400-146
Values & Lifestyles Program (VALS)—SRI International: OL40-400-150
Washington Beverage Insight—NewsNet, Inc.: OL40-400-153

Corporate Financial Information

S&P MarketScope—Standard & Poor's Corporation: OL40-400-101
Standard & Poor's Industry Financial Data Base—DRI/McGraw-Hill: OL40-400-117
Standard & Poor's News—Standard & Poor's Corporation: OL40-400-117
STAT-SCAN—Wright Investors' Service: OL40-400-118
Sydney Stock Exchange STATEX Service (STATEX)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-124
Value Line Database II—Value Line, Inc.: OL40-400-149
Value Line Estimates and Projections—Value Line, Inc.: OL40-400-149
Wall $treet Week Online—Dow Jones News/Retrieval: OL40-400-153
Zacks Corporate Earnings Estimator—Dow Jones News/Retrieval: OL40-400-161

Corporate Planning

Corporate Jobs Outlook!—NewsNet, Inc.: OL40-100-230
Utility Compustat—Standard & Poor's Compustat Services, Inc.: OL40-400-149

Court Administration and Management

School Law News—NewsNet, Inc.: OL40-400-104
SEC & Business News—NewsNet, Inc.: OL40-400-106

Credit Information

Card News—NewsNet, Inc.: OL40-100-229
SIS Commercial Remote Access—Statewide Information Systems: OL40-400-110
SIS Consumer Remote Access—Statewide Information Systems: OL40-400-110
Telecommunications Compustat—Standard & Poor's Compustat Services, Inc.: OL40-400-128
TRW Business Credit Profiles—NewsNet, Inc.: OL40-400-139
TRW Business Credit Services—TRW Information Services: OL40-400-139
TRW Credit Data Division—TRW Credit Data Division: OL40-400-139

Crime Related Information and Statistics

Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112

Cultural Relations

The Week in Germany—NewsNet, Inc.: OL40-400-154

Data Communications

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Computergram International—NewsNet, Inc.: OL40-100-230
Sateldata—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-400-103
Satellite News—NewsNet, Inc.: OL40-400-103
Seybold Outlook:Professional Computing—NewsNet, Inc.: OL40-400-108
SNA Communications Report—NewsNet, Inc.: OL40-400-112
TDS RFP/Tender Search—NewsNet, Inc.: OL40-400-127
TDS Tariff Search—NewsNet, Inc.: OL40-400-127
TDS Telecom Calendar—NewsNet, Inc.: OL40-400-127
Tech Extra (TE)—Electronet Information Systems, Inc.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Technology Watch (TW)—Electronet Information Systems, Inc.: OL40-400-128
Telecommunications Counselor—Voice & Data Resources, Inc.: OL40-400-128
Telecommunications Week—NewsNet, Inc.: OL40-400-129
Teledoc—Questel, Inc.: OL40-400-129
THERMODATA—THERMODATA: OL40-400-132
Tymnet Information System—Tymnet, McDonnell Douglas Network Systems Company: OL40-400-140
U.S. Naval Observatory Automated Data Service (ADS)—U.S. Naval Observatory: OL40-400-148
The Videodisc Monitor—NewsNet, Inc.: OL40-400-152
ViewText—NewsNet, Inc.: OL40-400-152
Washington Telecommunications Directory—NewsNet, Inc.: OL40-400-154
Who Makes Machinery (VDME)—Data-Star (D-S Marketing, Inc.): OL40-400-156
Worldwide Videotex Update—Worldwide Videotex: OL40-400-160

Data Management and Database Management

Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
Software (SOFT)—Data-Star (D-S Marketing, Inc.): OL40-400-113
Tech Extra (TE)—Electronet Information Systems, Inc.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Video Week—NewsNet, Inc.: OL40-400-151

Data Processing

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Computergram International—NewsNet, Inc.: OL40-100-230

Defense Information

USNI Military Database—Military Data Corporation: OL40-400-148

Defense Market Analysis

Counter-Terrorism Intelligence Report—NewsNet, Inc.: OL40-100-230
SDI Intelligence Report (formerly Star Wars Intelligence Report)—NewsNet, Inc.: OL40-400-105
SDI Monitor (Strategic Defense Initiative)—NewsNet, Inc.: OL40-400-105
Soviet Aerospace—NewsNet, Inc.: OL40-400-114
Space Business News—NewsNet, Inc.: OL40-400-115
Strategic Defense—NewsNet, Inc.: OL40-400-122
USNI Military Database—Military Data Corporation: OL40-400-148

Demographics

San Francisco Market—San Francisco Newspaper Agency: OL40-400-102
Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-109
Site-Potential—Technical Data International: OL40-400-110
SOLIS (Social Sciences Literature Information System)—STN International (The Scientific and Technical Information Network): OL40-400-114
TargetScan—Donnelley Marketing Information Services: OL40-400-124
Teenage Media/Market Study—Teenage Research Unlimited: OL40-400-128
10 Mediamarkets—Mediamark Research Inc.: OL40-400-130
Toronto Business Executives and Careers Study—Interactive Market Systems, Inc. (IMS): OL40-400-134
Update/The American States—Update/The American States: OL40-400-146
Upper Deck—Mediamark Research Inc.: OL40-400-146
Values & Lifestyles Program (VALS)—SRI International: OL40-400-150
Vision—Interactive Market Systems, Inc. (IMS): OL40-400-152
Yellow Pages DataSystem (YPD)—National Planning Data Corporation: OL40-400-161

Demographics International Data

U.N. Demographics—The WEFA Group: OL40-400-140

Development of Management Skills

TRAINING The Magazine of Human Resources Development—Executive Telecom System, Inc.: OL40-400-137

Directory of Companies

Spectrum Ownership Profile—CDA Investment Technologies, Inc.: OL40-400-115

Supplementary Subject Index

Trinet Company Database—DIALOG Information Services, Inc.: OL40-400-138
TSR-BIGS—Tokyo Shoko Research Ltd.: OL40-400-139
TSR-FINES—Tokyo Shoko Research Ltd.: OL40-400-139
Who Owns Whom (WOW)—Pergamon Financial Data Services (PFDS): OL40-400-156
Yellow Pages DataSystem (YPD)—National Planning Data Corporation: OL40-400-161

Directory of Periodicals

UMI Article Clearinghouse (UMAC)—BRS Information Technologies: OL40-400-142

Distributors

The Satellite Directory—NewsNet, Inc.: OL40-400-103

Drug Related Information

SEDBASE—Side Effects of Drugs Database—Elsevier Science Publishers: OL40-400-107

Econometric Forecasting

U.S. ECON Plus—ADP Data Services: OL40-400-146
U.S. Macroeconomic Statistics—The WEFA Group: OL40-400-147
Wall $treet Week Online—Dow Jones News/Retrieval: OL40-400-153
World Model Database—The WEFA Group: OL40-400-159

Economics

CANSIM—Statistics Canada, Cansim Division: OL40-100-229
Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
SMSA Building Permits—The WEFA Group: OL40-400-111
SMSA Business Structure—The WEFA Group: OL40-400-111
Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
South African Focus—NewsNet, Inc.: OL40-400-114
Sphinx (SPHX)—G.Cam Serveur: OL40-400-115
State Business Structures—The WEFA Group: OL40-400-119
State Employment—The WEFA Group: OL40-400-120
State Industry—The WEFA Group: OL40-400-120
State Macro—The WEFA Group: OL40-400-120
TA (Technology Assessment)—STN International (The Scientific and Technical Information Network): OL40-400-124
U.S. Macroeconomic—The WEFA Group: OL40-400-141
United Nations National Accounts (UNNA)—Haver Analytics, Inc.: OL40-400-144
United Nations Population Statistics (UNPOP)—Haver Analytics, Inc.: OL40-400-144
United States National Accounts (USNA)—Haver Analytics, Inc.: OL40-400-145
Update/The American States—Update/The American States: OL40-400-146
Utility Reporter—Fuels, Energy, and Power—NewsNet, Inc.: OL40-400-149
The Week in Germany—NewsNet, Inc.: OL40-400-154
Weekly U.S. Statistics (USWEEKLY)—Haver Analytics, Inc.: OL40-400-155
Yukon Bibliography (YKB)—QL Systems Ltd.: OL40-400-161

Economics—International

Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
Société Générale de Banque—Data-Star (D-S Marketing, Inc.): OL40-400-112
Stock Exchange of Singapore (SINGSTOCK)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-122
Sydney Stock Exchange STATEX Service (STATEX)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-124
U.N. National Income Accounts—The WEFA Group: OL40-400-140
VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150
World Debt Tables—The WEFA Group: OL40-400-159

Education

BIOSIS Connection—BIOSIS: OL40-100-227
BNBMARC—British Library Bibliographic Services: OL40-100-227
British Library Catalogue: Document Supply Centre (Monographs)—British Library Bibliographic Services: OL40-100-228
British Library Catalogue: Humanities and Social Sciences—British Library Bibliographic Services: OL40-100-228
CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
Cartographic Materials—British Library Bibliographic Services: OL40-100-229
Corporate Jobs Outlook!—Corporate Jobs Outlook!: OL40-100-230
St. Petersburg Times and Evening Independent—DataTimes Corporation: OL40-400-101
The San Diego Union and The Tribune—DataTimes Corporation: OL40-400-102
San Francisco Chronicle—DataTimes Corporation: OL40-400-102
School Law News—NewsNet, Inc.: OL40-400-104
SchoolMatch Profiles Database (SMP)—Executive Telecom System, Inc.: OL40-400-104
Seattle Times—DataTimes Corporation: OL40-400-106
Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-109
Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
Social SciSearch (SSCI)—BRS Information Technologies: OL40-400-112
Software Engineering Bibliographic (SEB)—Data & Analysis Center for Software: OL40-400-113
Southam News—DataTimes Corporation: OL40-400-114
Vertical File Index—The H.W. Wilson Company: OL40-400-151
Supertech—Bowker Electronic Publishing: OL40-400-123
SVERKER—The Swedish Institute of Building Documentation, BYGGDOK: OL40-400-123
TANDY (TRS)—CompuServe: OL40-400-124
Telecommunications—Bowker Electronic Publishing: OL40-400-128
TELELAB—SUNIST: OL40-400-129
The Telephone Industry Directory—NewsNet, Inc.: OL40-400-129
Text-Search Services (The Wall Street Journal)—Dow Jones News/Retrieval: OL40-400-131
Theses in Education (ED THESIS)—University of Alberta, Computing Systems: OL40-400-132
Time Magazine—VU/TEXT Information Services, Inc.: OL40-400-133
Training and Development Programs (A BNA Survey and Special Report)—BNA Online: OL40-400-136
Tulsa World/The Tulsa Tribune—DataTimes Corporation: OL40-400-140
U.S. Canada Free Trade Agreement—DataTimes Corporation: OL40-400-140
U.S. News and World Report—DataTimes Corporation: OL40-400-141
Umweltforschungsdatenbank (UFORDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142
Umweltliteraturdatenbank (ULIDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142
USA Today (USAA)—Data-Star (D-S Marketing, Inc.): OL40-400-148
The Vancouver Sun—DataTimes Corporation: OL40-400-150
Video Technology Newsletter—NewsNet, Inc.: OL40-400-151
VITIS-Viticulture and Enology Abstracts (VITIS-VEA)—International Food Information Service (IFIS GmbH): OL40-400-152
Vocational Education Curriculum Materials (VECM)—Ohio State University: OL40-400-152
Waste Management & Resources Recovery Information Database (WM/RR-ID)—International Research & Evaluation: OL40-400-154
Women in Sports (WASIRS)—University of Alberta, Computing Systems: OL40-400-158
Worcester Telegram and Gazette—DataTimes Corporation: OL40-400-158
Yukon Bibliography (YKB)—QL Systems Ltd.: OL40-400-161
Zoological Record Online (ZR Online)—BIOSIS: OL40-400-162

Electronics

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Semiconductor Industry & Business Survey (SIBS)—NewsNet, Inc.: OL40-400-107
TANDY (TRS)—CompuServe: OL40-400-124
Videolog—Videolog Communications: OL40-400-152
VtB (Verfahrenstechnische Berichte)—STN International (The Scientific and Technical Information Network): OL40-400-153
ZDE—Fiz Technik: OL40-400-161

Employee Management

The Changing Workplace: Staffing and Scheduling—BNA Online: OL40-400-131

Employment Related Information

Unemployment Compensation Wage Bases Database (UCBASE)—Executive Telecom System, Inc.: OL40-400-143

Employment Statistics

Unemployment Compensation Summaries—Executive Telecom System, Inc.: OL40-400-143
U.S. Employment Opp's—Advertising and PR—NewsNet, Inc.: OL40-400-147
U.S. Employment Opp's—Banking and Finance—NewsNet, Inc.: OL40-400-147
U.S. Employment Opp's—Federal Government—NewsNet, Inc.: OL40-400-147

Energy

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230

Supplementary Subject Index

SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109
Solar and Wind Energy Research Program (SWERP)—University of Alberta, Computing Systems: OL40-400-113
State Energy Data System (SEDS)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-120
U.S. Energy Forecast—The WEFA Group: OL40-400-141
Umweltforschungsdatenbank (UFORDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142
Umweltliteraturdatenbank (ULIDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142
United States Department of Energy (DOE)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-144
Utility Reporter—Fuels, Energy, and Power—NewsNet, Inc.: OL40-400-149
VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150
Wholesale Petroleum Price Diary—Lundberg Survey Inc.: OL40-400-157

Engineering

The Satellite Directory—NewsNet, Inc.: OL40-400-103

Engineering and Scientific

Aqueous Solubility Database (SOLUB)—Chemical Information Systems, Inc.: OL40-100-227
BIOSIS Connection—BIOSIS: OL40-100-227
Cambridge Structural Database (CSD)—Cambridge Crystallographic Data Centre: OL40-100-228
Canadian Environment (CENV)—QL Systems Ltd.: OL40-100-228
CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
SAE Global Mobility Database—Society of Automotive Engineers (SAE): OL40-400-101
Sateldata—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-400-103
Science Reference and Information Service Catalogue (SRIS)—British Library Bibliographic Services: OL40-400-104
SCISEARCH—Institute for Scientific Information (ISI): OL40-400-104
SDIM (System for Documentation and Information in Metallurgy)—STN International (The Scientific and Technical Information Network): OL40-400-105
Search Program for Infrared Spectra (SPIR)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-105
Selected Water Resources Abstracts (SWRA)—Water Resources Scientific Information Center: OL40-400-107
Semiconductor Parameter Retrieval (SCPR)—Information Handling Services: OL40-400-107
Ship Movement Library (SM)—LLoyd's Maritime Data Network: OL40-400-109
SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109
Society of Automotive Engineers Global Mobility—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-113
Software Engineering Bibliographic (SEB)—Data & Analysis Center for Software: OL40-400-113
Software Lifecycle Empirical Database (SLED)—Data & Analysis Center for Software: OL40-400-113
Solar and Wind Energy Research Program (SWERP)—University of Alberta, Computing Systems: OL40-400-113
Space Daily (formerly, Spacetime)—NewsNet, Inc.: OL40-400-115
Spacecomps—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-400-115
SSIE Current Research (Smithsonian Science Information Exchange)—DIALOG Information Services, Inc.: OL40-400-116
Standardline—British Standards Institution: OL40-400-118
Standards Search File—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-118
Structure and Nomenclature Search System (SANSS)—Chemical Information Systems, Inc.: OL40-400-122
Superconductor Week—NewsNet, Inc.: OL40-400-123
Supertech—Bowker Electronic Publishing: OL40-400-123
SVERKER—The Swedish Institute of Building Documentation, BYGGDOK: OL40-400-123
System for Documentation and Information in Metallurgy (SDIM1)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
System for Documentation and Information in Metallurgy (SDIM2)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
System for International Literature Information on Ceramics and Glass (SILICA)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
Technical Computing—NewsNet, Inc.: OL40-400-127
Technical Reports (TR)—Defense Technical Information Center (DTIC): OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Teclearn—Fiz Technik: OL40-400-128
Telecommunications—Bowker Electronic Publishing: OL40-400-128
Teledoc—Questel, Inc.: OL40-400-129
Telegenline—Bowker Electronic Publishing: OL40-400-129
TELELAB—SUNIST: OL40-400-129
THERMODATA—THERMODATA: OL40-400-132
Title-Search (TITLESRC)—Heiwa Information Center Co., Ltd.: OL40-400-133
Transportation Research Information Services (TRIS), National Research Council—Transportation Research Board: OL40-400-137
TRC Vapor Pressure Datafile—Technical Database Services, Inc.: OL40-400-138
Tribology Index (TRIBO)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-138
TULSA—Petroleum Abstracts: OL40-400-140
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—Derwent Publications Ltd.: OL40-400-142
Union List of Scientific Serials in Canadian Libraries (UNION)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-143
United States Department of Energy (DOE)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-144
United States Weekly Temperatures (HEATW)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-146
Urbamet—Questel, Inc.: OL40-400-146
U.S. Economy and Energy Forecast Data Base (Short Term)—Probe Economics, Inc.: OL40-400-147
U.S. Economy and Energy Forecast Data Base (Long Term)—Probe Economics, Inc.: OL40-400-147
U.S. Naval Observatory Automated Data Service (ADS)—U.S. Naval Observatory: OL40-400-148
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-148
U.S. Rail News (USRN)—NewsNet, Inc.: OL40-400-148
VADEMECUM—STN International (The Scientific and Technical Information Network): OL40-400-149
VANYTT—The Swedish Institute of Building Documentation, BYGGDOK: OL40-400-150
VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150
Vendor Information File (VEND)—Information Handling Services: OL40-400-150
Videolog—Videolog Communications: OL40-400-152
Volkswagenwerk (VWWW)—Data-Star (D-S Marketing, Inc.): OL40-400-152
VtB (Verfahrenstechnische Berichte)—STN International (The Scientific and Technical Information Network): OL40-400-153
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Top Boxoffice Films—Cineman Syndicate: OL40-400-133
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Video Marketing Newsletter—NewsNet, Inc.: OL40-400-151
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Canadian Environment (CENV)—QL Systems Ltd.: OL40-100-228
SCITECH (Science and Technology Databank)—University of Alberta, Computing Systems: OL40-400-105
SDIM (System for Documentation and Information in Metallurgy)—STN International (The Scientific and Technical Information Network): OL40-400-105
Seattle Post-Intelligencer—VU/TEXT Information Services, Inc.: OL40-400-105
SILICA (System for International Literature Information on Ceramics and Glass)—STN International (The Scientific and Technical Information Network): OL40-400-109
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State Capitals:Water Supply—NewsNet, Inc.: OL40-400-120

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TA (Technology Assessment)—STN International (The Scientific and Technical Information Network): OL40-400-124
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Suspect Chemicals Sourcebook (SUSPECT)—Chemical Information Systems, Inc.: OL40-400-123

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Turing Institute Database—Data-Star (D-S Marketing, Inc.): OL40-400-140

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Tax Management Portfolios, Estates, Gifts, and Trust Series—BNA Online: OL40-400-125
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Telerate II Historical Domestic and International Database—Telerate, Inc.: OL40-400-130
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Telerate II Historical Domestic and International Database—Telerate, Inc.: OL40-400-130

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Tax Management Portfolios, Foreign Income Series—BNA Online: OL40-400-125

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Sacramento Bee—VU/TEXT Information Services, Inc.: OL40-400-101
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Training and Development Programs (A BNA Survey and Special Report)—BNA Online: OL40-400-136

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Alberta Statistical Information System (ASIST)—Alberta Bureau of Statistics: OL40-100-227

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SDI Intelligence Report (formerly Star Wars Intelligence Report)—NewsNet, Inc.: OL40-400-105
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BPP Update Highlights (DD)—Executive Telecom System, Inc.: OL40-100-227
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Social SciSearch (SSCI)—BRS Information Technologies: OL40-400-112
Sphinx (SPHX)—G.Cam Serveur: OL40-400-115
VADEMECUM—STN International (The Scientific and Technical Information Network): OL40-400-149

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Vocational Training News—NewsNet, Inc.: OL40-400-152

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TRADSTAT World Trade Statistics—Data-Star (D-S Marketing, Inc.): OL40-400-136
United Nations Commodity Trade Statistics (SITC)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-143

Income Tax Related Information

Tax Management Portfolios, U.S. Income Series—BNA Online: OL40-400-125

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SRI International Business Intelligence Program Index (B-I-P Index)—DIALOG Information Services, Inc.: OL40-400-116
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U.S. Employment Opportunities—The Computer Field—NewsNet, Inc.: OL40-400-147

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Unemployment Compensation Summaries—Executive Telecom System, Inc.: OL40-400-143
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The Whig Standard (WHIG)—QL Systems Ltd.: OL40-400-156

Legislative Bill Information

Where There's Smoke: Problems and Policies Concerning Smoking in the Workplace—Executive Telecom System, Inc.: OL40-400-156

Library Information Systems

Science Reference and Information Service Catalogue (SRIS)—British Library Bibliographic Services: OL40-400-104
Union List of Scientific Serials in Canadian Libraries (UNION)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-143
Universal Serials and Book Exchange (USBE)—Universal Serials & Book Exchange, Inc.: OL40-400-146
WLN Database—Western Library Network: OL40-400-157

Library Related Information

BNBMARC—British Library Bibliographic Services: OL40-100-227
British Library Catalogue: Document Supply Centre (Monographs)—British Library Bibliographic Services: OL40-100-228
British Library Catalogue: Humanities and Social Sciences—British Library Bibliographic Services: OL40-100-228
Cartographic Materials—British Library Bibliographic Services: OL40-100-229
SCITECH (Science and Technology Databank)—University of Alberta, Computing Systems: OL40-400-105
Vertical File Index—The H.W. Wilson Company: OL40-400-151
Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries (CANUCS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-143
USNI Military Database—Military Data Corporation: OL40-400-148
VADEMECUM—STN International (The Scientific and Technical Information Network): OL40-400-149
World Conference on Electronic Printing & Publishing (WC)—Electronet Information Systems, Inc.: OL40-400-159

Life Sciences

VADEMECUM—STN International (The Scientific and Technical Information Network): OL40-400-149

Livestock

U.S. Agriculture Forecast—The WEFA Group: OL40-400-140

Macroeconomics

World Model Database—The WEFA Group: OL40-400-159

Mail List Generator

STNmail—STN International (The Scientific and Technical Information Network): OL40-400-122

Management Sciences

ASPA Net—American Society for Personnel Administration (ASPA): OL40-100-227
COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Corporate Jobs Outlook!—NewsNet, Inc.: OL40-100-230
Corporate Jobs Outlook!—Corporate Jobs Outlook!: OL40-100-230
Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
Science Reference and Information Service Catalogue (SRIS)—British Library Bibliographic Services: OL40-400-104

Supplementary Subject Index

SCRL—Questel, Inc.: OL40-400-105
SEC Online—SEC Online, Inc.: OL40-400-106
Seminar Clearinghouse Database—Executive Telecom System, Inc.: OL40-400-107
Seminar Information Service Database—Executive Telecom System, Inc.: OL40-400-108
Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
Vertical File Index—The H.W. Wilson Company: OL40-400-151
Tech Extra (TE)—Electronet Information Systems, Inc.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Theses of Economics and Business in Finland (THES)—Helsinki School of Economics Library: OL40-400-132
Training and Development Alert—Executive Telecom System, Inc.: OL40-400-136
Training For New Technologies: Success Stories For The 1990s—Executive Telecom System, Inc.: OL40-400-137
Training Media Database—Executive Telecom System, Inc.: OL40-400-137
Transinove (Transin)—Questel, Inc.: OL40-400-137
U.S. Economy and Energy Forecast Data Base (Short Term)—Probe Economics, Inc.: OL40-400-147
U.S. Economy and Energy Forecast Data Base (Long Term)—Probe Economics, Inc.: OL40-400-147
What's New in Collective Bargaining Negotiations and Contracts—Executive Telecom System, Inc.: OL40-400-156

Management Training

Training and Development Programs (A BNA Survey and Special Report)—BNA Online: OL40-400-136

Manufacturing

CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
Columbia Record—VU/TEXT Information Services, Inc.: OL40-100-229
COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
St. Petersburg Times and Evening Independent—DataTimes Corporation: OL40-400-101
The San Diego Union and The Tribune—DataTimes Corporation: OL40-400-102
San Francisco Chronicle—DataTimes Corporation: OL40-400-102
The Satellite Directory—NewsNet, Inc.: OL40-400-103
Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
Science Reference and Information Service Catalogue (SRIS)—British Library Bibliographic Services: OL40-400-104
Seattle Times—DataTimes Corporation: OL40-400-106
Semiconductor Parameter Retrieval (SCPR)—Information Handling Services: OL40-400-107
SILICA (System for International Literature Information on Ceramics and Glass)—STN International (The Scientific and Technical Information Network): OL40-400-109
Society of Manufacturing Engineers (SME)—NERAC, Inc.: OL40-400-113
Southam News—DataTimes Corporation: OL40-400-114
St. Paul Pioneer Press Dispatch—VU/TEXT Information Services, Inc.: OL40-400-116
Standardline—British Standards Institution: OL40-400-118
State Industry—The WEFA Group: OL40-400-120
System for Documentation and Information in Metallurgy (SDIM1)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
System for Documentation and Information in Metallurgy (SDIM2)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
System for International Literature Information on Ceramics and Glass (SILICA)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
Technical Computing—NewsNet, Inc.: OL40-400-127
Techno-Search (TECNOSRC)—Heiwa Information Center Co., Ltd.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Text-Search Services (The Wall Street Journal)—Dow Jones News/Retrieval: OL40-400-131
Textile Technology Digest (TTD)—Institute of Textile Technology: OL40-400-131
The State (Columbia)—VU/TEXT Information Services, Inc.: OL40-400-132
Thomas New Industrial Products—DIALOG Information Services, Inc.: OL40-400-132
Thomas Register Online—DIALOG Information Services, Inc.: OL40-400-132
The Toronto Star—Infomart: OL40-400-134
Trade Marks Opposition Board (TMOB)—QL Systems Ltd.: OL40-400-135
TRADSTAT World Trade Statistics—Data-Star (D-S Marketing, Inc.): OL40-400-136
Transinove (Transin)—Questel, Inc.: OL40-400-137
Tribology Index (TRIBO)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-138
Tulsa World/The Tulsa Tribune—DataTimes Corporation: OL40-400-140
U.S. Canada Free Trade Agreement—DataTimes Corporation: OL40-400-140
U.S. News and World Report—DataTimes Corporation: OL40-400-141
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—Derwent Publications Ltd.: OL40-400-142
United Kingdom Trademarks (UKTM)—Pergamon Financial Data Services (PFDS): OL40-400-143
United Nations Industrial Statistics (UNIND)—Haver Analytics, Inc.: OL40-400-144
United States Economic Statistics (USECON)—Haver Analytics, Inc.: OL40-400-144
U.S. Macroeconomic Statistics—The WEFA Group: OL40-400-147
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-148
The Vancouver Sun—DataTimes Corporation: OL40-400-150
Vendor Information File (VEND)—Information Handling Services: OL40-400-150
Videolog—Videolog Communications: OL40-400-152
VITIS-Viticulture and Enology Abstracts (VITIS-VEA)—International Food Information Service (IFIS GmbH): OL40-400-152
Washington Beverage Insight—NewsNet, Inc.: OL40-400-153
Weekly U.S. Statistics (USWEEKLY)—Haver Analytics, Inc.: OL40-400-155
Who Makes Machinery (VDME)—Data-Star (D-S Marketing, Inc.): OL40-400-156
Who Supplies What? (WLWE)—Data-Star (D-S Marketing, Inc.): OL40-400-157
The Windsor Star—Infomart: OL40-400-157
Worcester Telegram and Gazette—DataTimes Corporation: OL40-400-158

Marine Studies

Ship Movement Library (SM)—LLoyd's Maritime Data Network: OL40-400-109

Market Research

San Francisco Market—San Francisco Newspaper Agency: OL40-400-102
Site-Potential—Technical Data International: OL40-400-110
Standard & Poor's Corporate Descriptions—Standard & Poor's Corporation: OL40-400-117
Survey of Regular Drinkers-National Drinks Survey—Interactive Market Systems, Inc. (IMS): OL40-400-123
TargetScan—Donnelley Marketing Information Services: OL40-400-124
10 Mediamarkets—Mediamark Research Inc.: OL40-400-130
Trinet Database of U.S. Business Information—Trinet, Inc.: OL40-400-138
U.S. Economy and Energy Forecast Data Base (Short Term)—Probe Economics, Inc.: OL40-400-147
U.S. Economy and Energy Forecast Data Base (Long Term)—Probe Economics, Inc.: OL40-400-147
Values & Lifestyles Program (VALS)—SRI International: OL40-400-150
Various DATABASES with Quantitative and Chronological Data—SLIGOS: OL40-400-150
World Petrochemicals Program (WP DATA)—SRI International: OL40-400-160

Marketing

CBD Plus—DRI/McGraw-Hill: OL40-100-229
Corporate Jobs Outlook!—NewsNet, Inc.: OL40-100-230
Sami Shopping Centres (SHOPS)—Pergamon Financial Data Services (PFDS): OL40-400-102
Scarborough Reports—Interactive Market Systems, Inc (IMS): OL40-400-104
Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-109
Standard and Poor's MarketScope—Quotron Systems, Inc.: OL40-400-117
Standard & Poor's Register—Corporate—Standard & Poor's Corporation: OL40-400-117
Stockbroker Research Reports—Pergamon Financial Data Services (PFDS): OL40-400-122
The Study of Media & Markets (SMM)—Simmons Market Research Bureau, Inc.: OL40-400-122
Telefirm/Firm—Chambre de Commerce et D'Industrie: OL40-400-129
Telexport (TXPY)—Chambre de Commerce et D'Industrie: OL40-400-130
TRADEMARKSCAN-FEDERAL—Thomson & Thomson: OL40-400-136
TRADEMARKSCAN—STATE—Thomson & Thomson: OL40-400-136
Trinet Company Database—DIALOG Information Services, Inc.: OL40-400-138

Mass Spectra

Wiley Mass Spectral Search System (WMSSS)—Chemical Information Systems, Inc.: OL40-400-157

Mathematics

SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109

Supplementary Subject Index

Mathematics and Statistics

CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
SEC Online—SEC Online, Inc.: OL40-400-106
Software Engineering Bibliographic (SEB)—Data & Analysis Center for Software: OL40-400-113
Software Lifecycle Empirical Database (SLED)—Data & Analysis Center for Software: OL40-400-113
STATCAN—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-118
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Teledoc—Questel, Inc.: OL40-400-129
U.S. Naval Observatory Automated Data Service (ADS)—U.S. Naval Observatory: OL40-400-148
Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-157

Media

The Campaign Contribution Tracking System (Washington, DC)—Washington On-Line: OL40-100-228
CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
S&P Online—Standard & Poor's Corporation: OL40-400-101
Sacramento Bee—VU/TEXT Information Services, Inc.: OL40-400-101
St. Petersburg Times and Evening Independent—DataTimes Corporation: OL40-400-101
The San Diego Union and The Tribune—DataTimes Corporation: OL40-400-102
San Francisco Chronicle—DataTimes Corporation: OL40-400-102
San Francisco Market—San Francisco Newspaper Agency: OL40-400-102
San Jose Mercury News—VU/TEXT Information Services, Inc.: OL40-400-102
Scarborough Reports—Interactive Market Systems, Inc. (IMS): OL40-400-104
Seattle Post-Intelligencer—VU/TEXT Information Services, Inc.: OL40-400-105
Seattle Times—DataTimes Corporation: OL40-400-106
The Seybold Report on Publishing Systems—NewsNet, Inc.: OL40-400-108
Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-109
South African Focus—NewsNet, Inc.: OL40-400-114
Southam News—DataTimes Corporation: OL40-400-114
Sports Illustrated—VU/TEXT Information Services, Inc.: OL40-400-116
The Study of Media & Markets (SMM)—Simmons Market Research Bureau, Inc.: OL40-400-122
Supersite—Technical Data International: OL40-400-123
TDS RFP/Tender Search—NewsNet, Inc.: OL40-400-127
Tech Extra (TE)—Electronet Information Systems, Inc.: OL40-400-127
Technology Database (TD)—Electronet Information Systems, Inc.: OL40-400-127
Technology Watch (TW)—Electronet Information Systems, Inc.: OL40-400-128
Teenage Media/Market Study—Teenage Research Unlimited: OL40-400-128
Television Audience Estimates/Radio Audience Estimates—BBM Bureau of Measurement: OL40-400-130
10 Mediamarkets—Mediamark Research Inc.: OL40-400-130
Text-Search Services (The Wall Street Journal)—Dow Jones News/Retrieval: OL40-400-131
The State (Columbia)—VU/TEXT Information Services, Inc.: OL40-400-132
Time Magazine—VU/TEXT Information Services, Inc.: OL40-400-133
Top Management Insights—Simmons Market Research Bureau, Inc.: OL40-400-133
Toronto Business Executives and Careers Study—Interactive Market Systems, Inc. (IMS): OL40-400-134
The Toronto Star—Infomart: OL40-400-134
The Tradeline Service—Wellington Financial Corporation: OL40-400-135
Transportation News Ticker—VU/TEXT Information Services, Inc.: OL40-400-137
Tulsa World/The Tulsa Tribune—DataTimes Corporation: OL40-400-140
U.S. Canada Free Trade Agreement—DataTimes Corporation: OL40-400-140
U.S. News and World Report—DataTimes Corporation: OL40-400-141
Upper Deck—Mediamark Research Inc.: OL40-400-146
USA Today (USAA)—Data-Star (D-S Marketing, Inc.): OL40-400-148
USNI Military Database—Military Data Corporation: OL40-400-148
The Vancouver Sun—DataTimes Corporation: OL40-400-150
Video Technology Newsletter—NewsNet, Inc.: OL40-400-151
Videolog—Videolog Communications: OL40-400-152
Vision—Interactive Market Systems, Inc. (IMS): OL40-400-152
Wall $treet Week Online—Dow Jones News/Retrieval: OL40-400-153
WARNDEX (Wall Street Transcript)—VU/TEXT Information Services, Inc.: OL40-400-153
Washington Presstext—DIALOG Information Services, Inc.: OL40-400-154
The Wellington Letter—Wellington Financial Corporation: OL40-400-155
Wellington's Special Bulletin Service—Wellington Financial Corporation: OL40-400-155
West Coast Travel (WCT)—Lee Foster: OL40-400-155
Wichita Eagle-Beacon—VU/TEXT Information Services, Inc.: OL40-400-157
Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-157
The Windsor Star—Infomart: OL40-400-157
Worcester Telegram and Gazette—DataTimes Corporation: OL40-400-158
World Conference on Electronic Printing & Publishing (WC)—Electronet Information Systems, Inc.: OL40-400-159
World Reporter—Profile Information: OL40-400-160
Worldwide Vacation/Leisure Property Guide (WWX)—Worldwide Exchange: OL40-400-160

Medical and Health Care

BIOSIS Connection—BIOSIS: OL40-100-227
CANSIM Telichart—Faxtel Information Systems Ltd.: OL40-100-229
Safety Science Abstracts—Cambridge Scientific Abstracts: OL40-400-101
SANTECOM—PRIMA TELEMATIC, INC.: OL40-400-103
SEDBASE—Side Effects of Drugs Database—Elsevier Science Publishers: OL40-400-107
Selective Dissemination of Information On-line (SDILINE)—National Library of Medicine (NLM): OL40-400-107
SERials on-LINE (SERLINE)—National Library of Medicine (NLM): OL40-400-108
SMG Hospital Database—Urban Decision Systems, Inc.: OL40-400-111
Smoking and Health—DIALOG Information Services, Inc.: OL40-400-111
Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
Social Security Administration—CompuServe: OL40-400-112
Social Security and Medicare Fact Sheet—Executive Telecom System, Inc.: OL40-400-112
Vertical File Index—The H.W. Wilson Company: OL40-400-151
Standard Drug File (SDF)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-118
State Capitals:Public Health—NewsNet, Inc.: OL40-400-119
Substance Abuse In The Workplace: An Employer's Perspective—Executive Telecom System, Inc.: OL40-400-122
Supersite—Technical Data International: OL40-400-123
Telegenline—Bowker Electronic Publishing: OL40-400-129
Time Magazine—VU/TEXT Information Services, Inc.: OL40-400-133
TOXicology LITerature from Special Sources (TOXLIT)—National Library of Medicine (NLM): OL40-400-134
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—Derwent Publications Ltd.: OL40-400-142
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-148
VETDOC—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-151
VITIS-Viticulture and Enology Abstracts (VITIS-VEA)—International Food Information Service (IFIS GmbH): OL40-400-152
Worcester Telegram and Gazette—DataTimes Corporation: OL40-400-158
Workplace Health & Job Safety Report—Executive Telecom System, Inc.: OL40-400-158

Medical Literature

SERials on-LINE (SERLINE)—National Library of Medicine (NLM): OL40-400-108

Meetings, Conventions, and Travel

SiteSelex OnLine—Adam (Helen) & Associates, Inc.: OL40-400-110

Metallurgy

SDIM (System for Documentation and Information in Metallurgy)—STN International (The Scientific and Technical Information Network): OL40-400-105
System for Documentation and Information in Metallurgy (SDIM1)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
System for Documentation and Information in Metallurgy (SDIM2)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
Zinc, Lead and Cadmium (ZLC)—Zinc Development Association/Lead Development Association/and Cadmium Association: OL40-400-162

Metals

System for Documentation and Information in Metallurgy (SDIM1)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124

Supplementary Subject Index

System for Documentation and Information in Metallurgy (SDIM2)—Fachinformationszentrum Werkstoffe e.V.: OL40-400-124
THERMODATA—THERMODATA: OL40-400-132
Weldasearch—DIALOG Information Services, Inc.: OL40-400-155
World Aluminum Abstracts (WAA)—ASM International: OL40-400-158
Zinc, Lead and Cadmium (ZLC)—Zinc Development Association/Lead Development Association/and Cadmium Association: OL40-400-162

Money Management

Card News—NewsNet, Inc.: OL40-100-229
Thriftroll—The WEFA Group: OL40-400-132
Vestor/Colleague—Quotron Systems, Inc.: OL40-400-133

Natural Sciences

SCISEARCH—Institute for Scientific Information (ISI): OL40-400-104

Network Environments

SNA Communications Report—NewsNet, Inc.: OL40-400-112

News Media

San Jose Mercury News—VU/TEXT Information Services, Inc.: OL40-400-102
The Study of Media & Markets (SMM)—Simmons Market Research Bureau, Inc.: OL40-400-122
Telegraph Agency of the Soviet Union (TASS)—Mead Data Central, Inc.: OL40-400-129
The Toronto Star—Infomart: OL40-400-134
Universal News Services (UNS)—Mead Data Central, Inc.: OL40-400-146
The Windsor Star—Infomart: OL40-400-157
World Reporter—Profile Information: OL40-400-160
Xinhua English Language News Service—NewsNet, Inc.: OL40-400-161

News Summaries

Sacramento Bee—VU/TEXT Information Services, Inc.: OL40-400-101
San Jose Mercury News—VU/TEXT Information Services, Inc.: OL40-400-102
Seattle Post-Intelligencer—VU/TEXT Information Services, Inc.: OL40-400-105
St. Paul Pioneer Press Dispatch—VU/TEXT Information Services, Inc.: OL40-400-116
Tulsa World/The Tulsa Tribune—DataTimes Corporation: OL40-400-140
U.S. News and World Report—DataTimes Corporation: OL40-400-141
United Press International (UPI)—NewsNet, Inc.: OL40-400-144
WARNDEX (Wall Street Transcript)—VU/TEXT Information Services, Inc.: OL40-400-153
The Washington Post Online—The Washington Post: OL40-400-154
Washington Presstext—DIALOG Information Services, Inc.: OL40-400-154
Wichita Eagle-Beacon—VU/TEXT Information Services, Inc.: OL40-400-157
Worcester Telegram and Gazette—DataTimes Corporation: OL40-400-158
World Reporter—Profile Information: OL40-400-160

Nuclear Related Information

Seattle Post-Intelligencer—VU/TEXT Information Services, Inc.: OL40-400-105
SIGLE (System for Information on Grey Literature in Europe)—STN International (The Scientific and Technical Information Network): OL40-400-109
State Capitals:Public Utilities—NewsNet, Inc.: OL40-400-120

Occupational Health and Safety

Safety Science Abstracts—Cambridge Scientific Abstracts: OL40-400-101

Oil and Gas Exploration

Seismic Crew Count (CREW)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-107

Optical Storage

The Videodisc Monitor—NewsNet, Inc.: OL40-400-152

Organic Related Information

TRC Vapor Pressure Datafile—Technical Database Services, Inc.: OL40-400-138

Patents

U.S. PATENT OFFICE Files (USPA, USP77, USP70)—Derwent Publications Ltd.: OL40-400-142
U.S. PATENT OFFICE Files (USPA, USP77, USP70)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-148
USCLASS—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-148
World Patents Index—DIALOG Information Services, Inc.: OL40-400-159

Payroll and Personnel

ASPA Net—American Society for Personnel Administration (ASPA): OL40-100-227
Corporate Jobs Outlook!—Corporate Jobs Outlook!: OL40-100-230
Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
Seminar Clearinghouse Database—Executive Telecom System, Inc.: OL40-400-107
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State Regulation Report—Executive Telecom System, Inc.: OL40-400-120
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Training and Development Alert—Executive Telecom System, Inc.: OL40-400-136
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Unemployment Compensation Summaries—Executive Telecom System, Inc.: OL40-400-143
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What's New in Collective Bargaining Negotiations and Contracts—Executive Telecom System, Inc.: OL40-400-156
Workplace Health & Job Safety Report—Executive Telecom System, Inc.: OL40-400-158

Pension Services

Tax Reform Act of 1986 - Summaries (TXS)—Executive Telecom System, Inc.: OL40-400-126

Periodicals Directory Data

Scandinavian Periodicals Index in Economics and Business (SCANP)—Helsinki School of Economics Library: OL40-400-104
Trade & Industry ASAP—Information Access Company: OL40-400-135
Union List of Scientific Serials in Canadian Libraries (UNION)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-143
Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries (CANUCS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-143

Personnel

Standard & Poor's Register—Corporate—Standard & Poor's Corporation: OL40-400-117

Petroleum

COMPENDEX Plus—Engineering Information, Inc. (Ei): OL40-100-230
TULSA—Petroleum Abstracts: OL40-400-140
U.S. Energy Forecast—The WEFA Group: OL40-400-141
U.S. Oil Week—NewsNet, Inc.: OL40-400-141
United States Department of Energy (DOE)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-144
Weekly Statistical Bulletin (WSB)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-154
Wholesale Petroleum Price Diary—Lundberg Survey Inc.: OL40-400-157
World Petrochemicals Program (WP DATA)—SRI International: OL40-400-160

Pharmaceutical Industry Information

Standard Drug File (SDF)—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-118
VETDOC—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-400-151

Physics

SPIN (Searchable Physics Information Notices)—DIALOG Information Services, Inc.: OL40-400-116

Plastics Industry Information

VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150

Supplementary Subject Index

Weldasearch—DIALOG Information Services, Inc.: OL40-400-155

Political Science

Saga—G.Cam Serveur: OL40-400-101
Scott Polar Research Institute Library Catalogue (SPRI)—QL Systems Ltd.: OL40-400-105
Senat (SENA)—G.Cam Serveur: OL40-400-108
Social Sciences Index (SSI)—The H.W. Wilson Company: OL40-400-112
United States Political Science Documents (USPSD)—NASA Industrial Applications Center, University of Pittsburgh: OL40-400-145
U.S. Political Science Documents—DIALOG Information Services, Inc.: OL40-400-148
The Week in Germany—NewsNet, Inc.: OL40-400-154

Pollution

Umweltforschungsdatenbank (UFORDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142
Umweltliteraturdatenbank (ULIDAT)—STN International (The Scientific and Technical Information Network): OL40-400-142

Pollution Study Data

State Capitals:Pollution Control—NewsNet, Inc.: OL40-400-119

Price Indices (Consumer/Producer/Industry)

United States Producer Price Index Revision (USPPIR)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-145
U.S. Consumer Price Index (USCPI)—I.P. Sharp Associates Ltd. (A Reuter Company): OL40-400-146
Wholesale Petroleum Price Diary—Lundberg Survey Inc.: OL40-400-157

Professional Development Skills

TRAINING The Magazine of Human Resources Development—Executive Telecom System, Inc.: OL40-400-137

Programming Languages

SAA Age--An Inside Look at IBM—NewsNet, Inc.: OL40-400-101
Turing Institute Database—Data-Star (D-S Marketing, Inc.): OL40-400-140

Psychology

SOLIS (Social Sciences Literature Information System)—STN International (The Scientific and Technical Information Network): OL40-400-114

Public Health Information

Where There's Smoke: Problems and Policies Concerning Smoking in the Workplace—Executive Telecom System, Inc.: OL40-400-156

Publishing

The Satellite Directory—NewsNet, Inc.: OL40-400-103
The SciTech Report—NewsNet, Inc.: OL40-400-105
Sports Illustrated—VU/TEXT Information Services, Inc.: OL40-400-116

Publishing Industry Services

The Seybold Report on Publishing Systems—NewsNet, Inc.: OL40-400-108
TDS Market Report Search—NewsNet, Inc.: OL40-400-126

Purchasing Management

Surplus & Business Alert (formerly, Surplus Alert)—NewsNet, Inc.: OL40-400-123
U.S. Cost Planning Forecast—The WEFA Group: OL40-400-140
U.S. Economy and Energy Forecast Data Base (Short Term)—Probe Economics, Inc.: OL40-400-147
U.S. Economy and Energy Forecast Data Base (Long Term)—Probe Economics, Inc.: OL40-400-147

Real Estate Management

SiteNet—Conway Data, Inc.: OL40-400-110

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SSIE Current Research (Smithsonian Science Information Exchange)—DIALOG Information Services, Inc.: OL40-400-116
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The Satellite Directory—NewsNet, Inc.: OL40-400-103

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The SciTech Report—NewsNet, Inc.: OL40-400-105

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SITRAFO (Service Industrie et Transfer)—STN International (The Scientific and Technical Information Network): OL40-400-110

Scientific

Scott Polar Research Institute Library Catalogue (SPRI)—QL Systems Ltd.: OL40-400-105

Scientific and Engineering

SILICA (System for International Literature Information on Ceramics and Glass)—STN

Supplementary Subject Index

International (The Scientific and Technical Information Network): OL40-400-109

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VDI-N (VDI-Nachrichten)—VDI Verlag GmbH: OL40-400-150
World Transindex (WTI)—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-400-160
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Rapra—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-300-221

Political Science

Daily Congressional and Presidential Calendar—BNA Online: OL40-200-103
The Daily Texan—DataTimes Corp.: OL40-200-104
The Dallas Morning News—DataTimes Corp.: OL40-200-105
DMSII DBDONOR—National Data Services, Inc.: OL40-200-118
Eighteenth Century Short Title Catalog—The Research Libraries Group, Inc.: OL40-200-140
Facts on File World News Digest—Facts On File, Inc.: OL40-200-162
Foreign Affairs Library (FALI)—Belindis-Belgian Ministry of Economic Affairs: OL40-200-175
Kaleidoscope: Current World Data (KCWD)—ABC-CLIO: OL40-300-106

Pollution Study Data

Ecothek—Questel, Inc.: OL40-200-136
ENDOC—European Commission Host Organization (ECHO): OL40-200-146
ENREP—European Commission Host Organization (ECHO): OL40-200-149
Environment Reporter—BNA Online: OL40-200-151
Oil and Hazardous Materials—Technical Assistance Data (OHM-TADS)—Chemical Information Systems, Inc.: OL40-300-179
Plant and Production Data (TSCAPP)—Chemical Information Systems, Inc.: OL40-300-204

Supplementary Subject Index

Pollution Abstracts (PA)—Cambridge Scientific Abstracts: OL40-300-206

Population Study Data

Household Age/Income Forecast—Wharton Econometric: OL40-200-205
National Planning Association United States Demographic Forecast Data (NPADEMOG)—I.P. Sharp Associates Limited: OL40-300-157
Population Bibliography—Carolina Population Center: OL40-300-207
Population Information On Line (POPLINE)—Population Information Program-Johns Hopkins University: OL40-300-208

Price Indices (Consumer/Producer/Industry)

DRI International Cost Forecasting—Data Resources (DRI): OL40-200-125
DRI U.S. Prices Data Bank—Data Resources (DRI): OL40-200-128
Metals Week—Data Resources (DRI): OL40-300-137

Project Management

International Construction Database (ICONDA)—Informationszentrum RAUM und BAU der Fraunhofer Gesellschaft (IRB): OL40-200-135

Property Management

Real Estate Information Network, Inc. (R.E.I.N.)—Real Estate Information Network: OL40-300-223

Prospect Identification

International Dun's Market Identifiers (DMI)—Duns Marketing Services: OL40-200-135

Psychology

Educational Research Forum—CompuServe, Inc.: OL40-200-138
JOUETS—IST-Informatheque Inc.: OL40-300-105
Journals (Index to Articles in Psychometrica)—University of Alberta, Computing Services: OL40-300-105
Medical and Psychological Previews (MPPS)—BRS Information Technologies: OL40-300-131
PME-SME—IST-Informatheque Inc.: OL40-300-205
PsycALERT—PsycINFO: OL40-300-212
PsycINFO—PsycINFO: OL40-300-213
Religion Index—DIALOG Information Services, Inc.: OL40-300-225

Public Health Information

Where There's Smoke: Problems and Policies Concerning Smoking in the Workplace—Executive Telecom System, Inc.: OL40-400-211

Publishing Industry Services

Data Informer—NewsNet, Inc.: OL40-200-105
Dictionary—University of Alberta, Computing Services: OL40-200-113
H.W. Wilson Publisher Directory File—The H.W. Wilson Company: OL40-200-209
Kirkus Book Reviews—NewsNet, Inc.: OL40-300-107
Magazines and Books—General Videotex Corp. (GVC) Delphi: OL40-300-120
Microforms in Print—BRS Information Technologies: OL40-300-139
Morgan Report on Directory Publishing—NewsNet, Inc.: OL40-300-148
OCLC EASI Reference—BRS Information Technologies: OL40-300-175
Paper & Board Abstracts—PIRA: OL40-300-192
PPR (Periodical Publishing Record)—University of Alberta, Computing Services: OL40-300-208

Pulp and Paper Industry

Paper & Board Abstracts—PIRA: OL40-300-192
Paperchem—Institute of Paper Chemistry (IPC): OL40-300-192
Pira—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-300-204
RISI Pulp and Paper Data Bank—Data Resources (DRI): OL40-300-227

Purchasing Management

IDI Master Catalog (Item Data Master)—Burns Computing Services, Inc.: OL40-200-214
JordanWatch—Jordan & Sons Limited: OL40-300-104

Real Estate Management

Dataquick Information Network—Dataquick Information Systems: OL40-200-107
Exchange Network—Exchange Network, Inc.: OL40-200-160
INFORM—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-200-223
International Listing Service (ILS)—International Listing Service, Inc.: OL40-200-137
Ober Income Letter—NewsNet, Inc.: OL40-300-174
Pop-Facts—National Decision Systems, Inc. (NDS): OL40-300-207
Real Estate & Venture Funding Directory—NewsNet, Inc.: OL40-300-222
Real Estate Buyers Directory—NewsNet, Inc.: OL40-300-222
Real Estate Information Network, Inc. (R.E.I.N.)—Real Estate Information Network: OL40-300-223
Real Estate Listing Service (RELS)—MDR Telecom: OL40-300-223
Regional Real Estate and Construction Forecast—Chase Econometrics: OL40-300-224

Rehabilitation

REHABDATA—National Rehabilitation Information Center: OL40-300-225

Religion

Lutheran News Service—NewsNet, Inc.: OL40-300-119
Religion Index—DIALOG Information Services, Inc.: OL40-300-225
RNS Daily News Reports—NewsNet, Inc.: OL40-300-227

Research and Technology Transfer

Directory of Federally Supported Research in Universities (IEC)—Canada Institute for Scientific and Technical Information (CISTI): OL40-200-115
NTIS Bibliographic Database—National Technical Information Service: OL40-300-173
Research and Technology Work Unit Information System (WUIS)—Defense Technical Information Center (DTIC): OL40-300-227

Resource Directory

Dictionary—University of Alberta, Computing Services: OL40-200-113
DIRLINE (Directory of Information Resources Online)—National Library of Medicine (NLM): OL40-200-115
Enviroalta—University of Alberta, Computing Services: OL40-200-150
North Carolina Companies Database (NCCD)—Data-Search: OL40-300-171
Prime (Principal Researcher's Interest and Major Expertise)—University of Alberta, Computing Services: OL40-300-210
Real Estate Buyers Directory—NewsNet, Inc.: OL40-300-222

Retail Industry Information

Fifth Avenue Shopper—H & J Price Co.: OL40-200-168
Mercatis—Societe d'Etudes pour le Developement Economique et Sociatl (SEDES): OL40-300-134

Retail Trade Data

Electronic Mall—CompuServe, Inc.: OL40-200-142
Mercatis—Societe d'Etudes pour le Developement Economique et Sociatl (SEDES): OL40-300-134
Site—CACI, Inc.—Federal: OL40-400-205

Robotics

High Tech International—NewsNet, Inc.: OL40-200-200
Robomatix Online—EIC/Intelligence, Inc.: OL40-300-227
Robot News—NewsNet, Inc.: OL40-300-227

Rubber Industry

Rapra—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-300-221

Safety Related Information

DECHEMA—STN International (The Scientific and Technical Information Network): OL40-200-108
Highway Safety Literature (HSL)—Transportation Research Board: OL40-200-201
HSE PRESTEL—Health and Safety Executive: OL40-200-207
Industrial Health & Hazards Update—NewsNet, Inc.: OL40-200-220
Job Safety and Health (JOSH)—BNA Online: OL40-300-104
Labor Relations Week—Executive Telecom System, Inc.: OL40-300-108
Literature Analysis System on Road Safety (LASORS)—Federal Office of Road Safety: OL40-300-116
National Pesticide Information Retrieval System (NPIRS)—National Pesticide Information Retrieval System (NPIRS): OL40-300-156
NIOSHTIC Database—National Technical Information Service: OL40-300-168
Occupational Safety and Health Reporter (OSHR)—BNA Online: OL40-300-175
Radiology & Imaging Letter—NewsNet, Inc.: OL40-300-220

Supplementary Subject Index

VDTs in the Workplace: A Study of the Effects on Employment—Executive Telecom System, Inc.: OL40-400-210

Sales and Distribution

D&B-Dun's Electronic Yellow Pages—Services Directory—DIALOG Information Services, Inc.: OL40-200-102
D&B-Dun's Electronic Yellow Pages—Wholesalers—DIALOG Information Services, Inc.: OL40-200-102
D&B-Dun's Electronic Yellow Pages—Manufacturers—DIALOG Information Services, Inc.: OL40-200-102
D&B-Dun's Electronic Yellow Pages—Retailers—DIALOG Information Services, Inc.: OL40-200-102
D&B-Dun's Electronic Yellow Pages—Professionals—DIALOG Information Services, Inc.: OL40-200-101
Dataline—Information Access Company: OL40-200-106
DEBS Confectionary Marketing Data Base—Management Science Associates, Inc.: OL40-200-108
DIALOG Publications—DIALOG Information Services, Inc.: OL40-200-113
Disclosure Online—Disclosure: OL40-200-116
DORIS (Demographic Online Retrieval Information System)—CACI, Inc.—Federal: OL40-200-120
Dun's Financial Records (DFR)—Duns Marketing Services: OL40-200-130
EasyVet—IMS America Ltd.: OL40-200-132
Econometric Data Bank—Computer Sciences of Australia Pty. Ltd.: OL40-200-134
Economic Time Series—Computer Sciences of Australia Pty. Ltd.: OL40-200-135
Electronic Mall—CompuServe, Inc.: OL40-200-142
The Electronic Registrar—Solution Associates, Inc.: OL40-200-143
Electronic Selective Archives (ELSA)—The Swiss News Agency: OL40-200-143
Employment and Earnings (EE)—SAGE DATA, Inc.: OL40-200-145
European Index of Management Periodicals (SCIMP)—Helsinki School of Economics Library: OL40-200-159
Farmpulse—Data Support Services, Inc.: OL40-200-163
Fifth Avenue Shopper—H & J Price Co.: OL40-200-168
Foreign Traders Index—DIALOG Information Services, Inc.: OL40-200-177
General Chemicals (GENCHEM)—SAGE DATA, Inc.: OL40-200-185
GPO Current Awareness—Information/Documentation (Info/Doc): OL40-200-192
GraphicProfile—Donnelley Marketing Information Services: OL40-200-193
Herb Irelands Sales Prospector—NewsNet, Inc.: OL40-200-200
IBC Barter Countertrade—Wants—Barter Worldwide Inc.: OL40-200-209
IBC Bids and Buyers Clearinghouse—Barter Worldwide Inc.: OL40-200-210
IBC Inventory Liquidation Clearinghouse—Barter Worldwide Inc.: OL40-200-210
IBC Sellers Clearinghouse—Barter Worldwide Inc.: OL40-200-210
Information Centre of the Société Générale de Banque (SGBD)—Belindis-Belgian Ministry of Economic Affairs: OL40-200-224
Inorganic and Fertilizer Chemicals Forecast Data Base: Short-Term Forecasts (INA/INB)—Probe Economics, Inc.: OL40-200-227
Inorganic and Fertilizer Chemicals Forecast Data Base: Long-Term Forecasts (INAL/INBL/INCL)—Probe Economics, Inc.: OL40-200-227
Inorganic and Fertilizer Chemicals—SAGE DATA, Inc.: OL40-200-227
Instant Yellow Page Service—Instant Yellow Page Service: OL40-200-130
International Business Clearinghouse (IBC)—Barter Worldwide Inc.: OL40-200-134
International Entrepreneur—Ja Nef Global Securities: OL40-200-136
JordanWatch—Jordan & Sons Limited: OL40-300-104
LabNet—IMS America Ltd.: OL40-300-108
Lundberg Share of Market (SOM)—Lundberg Survey Inc.: OL40-300-119
Mercatis—Societe d'Etudes pour le Developement Economique et Sociatl (SEDES): OL40-300-134
Microcomputer Software and Hardware Guide—R. R. Bowker Company: OL40-300-138
Motor Vehicle Registrations—Computer Sciences of Australia Pty. Ltd.: OL40-300-149
MRI (Mediamark Research Inc.)—Mediamark Research Inc.: OL40-300-149
National Electrical Manufacturers Association (NEMA)—General Electric Information Services Co. (GEISCO): OL40-300-153
National Pesticide Information Retrieval System (NPIRS)—National Pesticide Information Retrieval System (NPIRS): OL40-300-156
North Carolina Companies Database (NCCD)—Data-Search: OL40-300-171
On-Line Access Strategic Information Service—IMS America Ltd.: OL40-300-180
The Ottawa Citizen—Infomart: OL40-300-189
Petrochemicals (PETROS)—SAGE DATA, Inc.: OL40-300-197
Petrochemicals Long-Term Forecast (PETAL/PETBL)—Probe Economics, Inc.: OL40-300-197
Petrochemicals Short-Term Forecast Data Base (PETA/PETB)—Probe Economics, Inc.: OL40-300-197
Plastic Chemicals (PLASTICS)—SAGE DATA, Inc.: OL40-300-205
Plastic Chemicals Long-Term Forecast (PLASAL/PLASBL)—Probe Economics, Inc.: OL40-300-205
Plastic Chemicals Short-Term Forecast (PLASA/PLASB)—Probe Economics, Inc.: OL40-300-205
Podgehodge—Arion II: OL40-300-206
Pop-Facts—National Decision Systems, Inc. (NDS): OL40-300-207
Population (POP)—SAGE DATA, Inc.: OL40-300-207
Population Census (C71, C76, C81)—Computer Sciences of Australia Pty. Ltd.: OL40-300-207
RANDATA—Rand McNally & Company: OL40-300-220

Sales and Market Information

DEBS Confectionary Marketing Data Base—Management Science Associates, Inc.: OL40-200-108
Industrial Market Locations—Pergamon InfoLine (Pergamon ORBIT InfoLine, Inc. division): OL40-200-220
Million Dollar Directory (M.D.D.)—Duns Marketing Services: OL40-300-142

Satellites

LEDA—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-300-111
Military Fiber Optics News—NewsNet, Inc.: OL40-300-142
Military Space—NewsNet, Inc.: OL40-300-142

Scientific Technical Literature

DECHEMA—STN International (The Scientific and Technical Information Network): OL40-200-108
DKI (Plastics, Rubber, Fibres)—Deutsches Kunststoff-Institut: OL40-200-117
EABS—European Commission Host Organization (ECHO): OL40-200-131
Eurodicautom—European Commission Host Organization (ECHO): OL40-200-158
General Science Index—The H.W. Wilson Company: OL40-200-185
JICST File on Current Science and Technology Research in Japan—Japan Information Center of Science and Technology: OL40-300-103
JICST File on Government Reports in Japan—Japan Information Center of Science and Technology: OL40-300-103
JICST File on Science and Technology—Japan Information Center of Science and Technology: OL40-300-103
Martindale Online—Data-Star D-S Marketing, Inc.: OL40-300-126
MEDITEC—DIMDI (German Institute for Medical Documentation and Information): OL40-300-133
NEI (Nordic Energy Index)—I/S Datacentralen: OL40-300-159
NRC Publications (NRCPUBS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-300-172

Securities

Daily Sec Advance—BNA Online: OL40-200-104
Dial/Data—Hale Systems, Inc.: OL40-200-112
Disclosure Online—Disclosure: OL40-200-116
Dow Jones Quotes—Dow Jones News/Retrieval: OL40-200-121
Economist's Statistics Database—James R. LymBurner & Sons, Ltd.: OL40-200-135
Exbond—Extel Statistical Services Limited: OL40-200-159
The EXCHANGE Service—Mead Data Central, Inc.: OL40-200-160
Exshare—Wharton Econometric: OL40-200-161
Financial Database (FDB)—National University of Singapore: OL40-200-170
Financial Post Securities Database—Financial Post Information Service: OL40-200-171
Financial Securities Data (FISCAL)—National Computer Network Corporation: OL40-200-171
Historical Quotes—Dow Jones News/Retrieval: OL40-200-202
Hong Kong Stock Exchange (HKSTOCK)—I.P. Sharp Associates Limited: OL40-200-203
IDSIPORT—Interactive Data Services, Inc.: OL40-200-215
Index to Legal Periodicals—The H.W. Wilson Company: OL40-200-218
Institutional Brokers Estimate System (I/B/E/S)—Lynch, Jones & Ryan: OL40-200-131
International New Issues—Securities Data Company, Inc.: OL40-200-138
Listed Options Database (OPTDAT)—National Computer Network Corporation: OL40-300-116
Market Decision System-7 (MDS-7)—Bunker Ramo Information Systems: OL40-300-123
Marketfax Professional Stock Charting Service—Marketfax InfoServices Ltd.: OL40-300-124
Marketscan—Info Globe: OL40-300-124
McGraw-Hill Business Backgrounder—DIALOG Information Services, Inc.: OL40-300-128
MicroQuote—CompuServe, Inc.: OL40-300-140
MISTI II—Control Data Corp., Business Information Services: OL40-300-144
Monchik-Weber Option Monitor Service—Standard and Poor's Financial Systems & Trading Services Group: OL40-300-146
Monchik-Weber Price Access Service—Standard and Poor's Financial Systems & Trading Services Group: OL40-300-146
Money Card News—NewsNet, Inc.: OL40-300-146
Mortgage-Backed Securities—Interactive Data Corp.: OL40-300-148

Supplementary Subject Index

Muller Data—Muller Data Corp.: OL40-300-150
New Issues of Corporate Securities—Securities Data Company, Inc.: OL40-300-160
New Issues of Municipal Debt—Securities Data Company, Inc.: OL40-300-160
North American Stock Market (NASTOCK)—I.P. Sharp Associates Limited: OL40-300-170
On-line Stock Option Analysis—Broker Services, Inc.: OL40-300-180
Options—FRI Corp.: OL40-300-186
Private Placements—Securities Data Company, Inc.: OL40-300-210
Rapidquote II—National Data Corp. (NDC): OL40-300-221

Shipping Industry Information

ECS Marine Credit Reports—VU/TEXT Information Services, Inc.: OL40-200-136
Houston Chronicle—DataTimes Corp.: OL40-200-206
NHH Databank—SAF Center for Applied Research: OL40-300-166

Social Sciences

Data Library—University of Alberta, Computing Services: OL40-200-106
Directory of American Research and Technology—Pergamon InfoLine (Pergamon ORBIT InfoLine, Inc. division): OL40-200-114
Educational Testing Service Test Collection (ETSF)—Educational Testing Service: OL40-200-138
Family Resources—National Council on Family Relations: OL40-200-162
Francis (Frch. Rtrvl. Auto. Ntwk. for Crnt. Info. in Soc. & Hum. Sci.)—Questel, Inc.: OL40-200-180
INFORM—ORBIT Search Service (Pergamon ORBIT InfoLine, Inc. division): OL40-200-223
Linguistics and Language Behavior Abstracts (LLBA)—DIALOG Information Services, Inc.: OL40-300-115
MAGHREB—Sunist: OL40-300-121
Mental Measurements Yearbook (MMYD)—Buros Institute of Mental Measurements: OL40-300-134
MLA Bibliography (MLAB)—Modern Language Association of America: OL40-300-144
NASA—European Space Agency—Information Retrieval Service (ESA/IRS): OL40-300-152
PAIS International—Public Affairs Information Service: OL40-300-191
Philosopher's Index—Bowling Green State University: OL40-300-201
Population Bibliography—Carolina Population Center: OL40-300-207
PsycALERT—PsycINFO: OL40-300-212
PsycINFO—PsycINFO: OL40-300-213

Sociology

Educational Research Forum—CompuServe, Inc.: OL40-200-138
International Bibliography of the Social Sciences (IBSS)—QL Systems Limited: OL40-200-134
National Adoption Exchange—GTE Telenet: OL40-300-152
Religion Index—DIALOG Information Services, Inc.: OL40-300-225

Space Sciences

National Energy Software Center Abstract (NES)—U.S. Department of Energy, Office of Scientific and Technical Information: OL40-300-154

Special Education

Disabilities Forum—The Clarke School for the Deaf: OL40-200-116

Spectral Related Information

Mass Spectral Search System (MSSS)—Chemical Information Systems, Inc.: OL40-300-126
Mass Spectrometry Bulletin (MSB)—The Royal Society of Chemistry Information Services: OL40-300-126

Sports

El Miami Herald (Spanish Edition)—VU/TEXT Information Services, Inc.: OL40-200-140
The Gazette (Montreal, Canada)—Infomart: OL40-200-185
The Gold Sheet—NewsNet, Inc.: OL40-200-190
Miami Herald—VU/TEXT Information Services, Inc.: OL40-300-137
News/Retrieval Sports Report—Dow Jones News/Retrieval: OL40-300-162
Philadelphia Daily News—VU/TEXT Information Services, Inc.: OL40-300-201
Philadelphia Inquirer—VU/TEXT Information Services, Inc.: OL40-300-201

Standards and Specifications

DICOMTA (Documentation Informatisee pour les Comptables)—CCMC-CEDIC: OL40-200-113
GATT—Danish Standards Association: OL40-200-184
Industry and International Standards (STDS)—Information Handling Services: OL40-200-221
Industry Standards and Military Specifications (ISMS)—Information Handling Services: OL40-200-222
Military and Federal Specifications and Standards (MLSS)—Information Handling Services: OL40-300-142
National Bureau of Standards—NewsNet, Inc.: OL40-300-153
Noriane—Association Francaise de Normalisation: OL40-300-170
NORMEQ—IST-Informatheque Inc.: OL40-300-170
Occupational Safety and Health Reporter (OSHR)—BNA Online: OL40-300-175
Standardline—British Standards Organization: OL40-400-206

Statistics

Daily Report for Executives—BNA Online: OL40-200-104
Deutsche Bundesbank Data—I.P. Sharp Associates Limited: OL40-200-111
Drilling Activity Analysis System (DAAS)—Petroleum Information: OL40-200-128
Eastern Bloc Countries Economic Statistics (WIIW)—I.P. Sharp Associates Limited: OL40-200-132
Federal Republic of Germany Statistical Data (STATISBUND)—I.P. Sharp Associates Limited: OL40-200-167
IATA Statistical Information System—I.P. Sharp Associates Limited: OL40-200-209
Interactivity Report—NewsNet, Inc.: OL40-200-133
MICROLIB (Microcomputer Software Library)—University of Alberta, Computing Services: OL40-300-139
Monroe Mendelsohn College—Interactive Market Systems (IMS): OL40-300-147
Nielsen Network Programs by DMA—Interactive Market Systems (IMS): OL40-300-166
Nielsen Viewers in Profile—Interactive Market Systems (IMS): OL40-300-167
North Ireland Readership—Interactive Market Systems (IMS): OL40-300-171
Pace—Interactive Market Systems (IMS): OL40-300-190
Prizm—Interactive Market Systems (IMS): OL40-300-211
PTS International Forecasts—DIALOG Information Services, Inc.: OL40-300-214

Steel and Iron Industry

DRI Steel Data Base—Data Resources (DRI): OL40-200-127
Iron and Steel—Wharton Econometric: OL40-200-142

Stock Information

Daily Industrial Index Analyzer (DIIA)—NewsNet, Inc.: OL40-200-103
Daily Sec Advance—BNA Online: OL40-200-104
Dial/Data—Hale Systems, Inc.: OL40-200-112
Dow Jones Quotes—Dow Jones News/Retrieval: OL40-200-121
Dow Jones Tracking Service—Dow Jones News/Retrieval: OL40-200-121
Equities/Options—Futures/Options—Network—Standard and Poor's Financial Systems & Trading Services Group: OL40-200-155
Equitrends—Lynch, Jones & Ryan: OL40-200-155
Esprit—Extel Financial & Business Services: OL40-200-156
Financial Database (FDB)—National University of Singapore: OL40-200-170
Financial Post Bonds (FPBOND)—Financial Post Information Service: OL40-200-170
Ford Investment Review—NewsNet, Inc.: OL40-200-175
Hong Kong Stock Exchange (HKSTOCK)—I.P. Sharp Associates Limited: OL40-200-203
IDSIPORT—Interactive Data Services, Inc.: OL40-200-215
Industry—Haver Analytics, Inc.: OL40-200-221
Insider Trading Monitor—Invest/Net: OL40-200-129
Insider Weekly Summary—NewsNet, Inc.: OL40-200-130
Investment Services—Source Telecomputing Corp. (STC): OL40-200-141
Investors Daily (IVDA)—BRS Information Technologies: OL40-200-142
Japan Weekly Monitor—NewsNet, Inc.: OL40-300-102
Listed Options Database (OPTDAT)—National Computer Network Corporation: OL40-300-116
London Oil Reports (LOR)—I.P. Sharp Associates Limited: OL40-300-118
Market Decision System-7 (MDS-7)—Bunker Ramo Information Systems: OL40-300-123
Market Reports (MKTHIGH)—CompuServe, Inc.: OL40-300-123
Marketfax—Marketfax InfoServices Ltd.: OL40-300-123
Marketfax Professional Stock Charting Service—Marketfax InfoServices Ltd.: OL40-300-124
Markets Advisory—Quotron Systems, Inc.: OL40-300-124
Max Ule's Tickerscreen (TICKERSCREEN)—CompuServe, Inc.: OL40-300-128
Merrill Lynch Equity—Shaw Data Services: OL40-300-136
MISTI II—Control Data Corp., Business Information Services: OL40-300-144
Moneydata—Technical Data Corp.: OL40-300-147
Muller Data—Muller Data Corp.: OL40-300-150
Naico-Net—General Videotex Corp. (GVC) Delphi: OL40-300-151
News-a-tron—News-a-tron Corp.: OL40-300-162
Nite-Line—National Computer Network Corporation: OL40-300-168
No-Load Mutual Fund Directory—CompuServe, Inc.: OL40-300-169
OECD Flows and Stocks of Fixed Capital (OECDCAP)—I.P. Sharp Associates Limited: OL40-300-176

Supplementary Subject Index

On-line Stock Option Analysis—Broker Services, Inc.: OL40-300-180
PETROFLASH! Crude and Product Report (PETROFLASH)—I.P. Sharp Associates Limited: OL40-300-198
Pink Sheets—Quotron Systems, Inc.: OL40-300-203
Portfolio Summary (PORT)—CompuServe, Inc.: OL40-300-208
Prices—CompuServe, Inc.: OL40-300-209
Profit Report—NewsNet, Inc.: OL40-300-212
Quick Quote—CompuServe, Inc.: OL40-300-218
Quick Way—CompuServe, Inc.: OL40-300-219
QUOTDIAL—Quotron Systems, Inc.: OL40-300-219
Quotron Symbol Guide—Quotron Systems, Inc.: OL40-300-219
Real Time Quotes (RTQ)—Dow Jones News/Retrieval: OL40-300-223

Student Related Information

Education Index—The H.W. Wilson Company: OL40-200-137
Educational Travel Connection—CompuServe, Inc.: OL40-200-138
Gradline—DIALOG Information Services, Inc.: OL40-200-193
Monroe Mendelsohn College—Interactive Market Systems (IMS): OL40-300-147
NTNF Projects—Norsk senter for informatikk (NSI): OL40-300-173
PEPSY—Norsk senter for informatikk (NSI): OL40-300-195

Tariff Information

FCC Daily Tariff Log—NewsNet, Inc.: OL40-200-164
Numerax Logistics Information System-ONLINE—Numerax Inc.: OL40-300-174
Q-TEL 9000—CCMI/McGraw-Hill: OL40-300-217

Tax Calculation/Budgeting/Processing

Grossup (Salary)—On-Line Research Inc.: OL40-200-194

Tax Related Information

Daily Report for Executives—BNA Online: OL40-200-104
Daily Tax Report—BNA Online: OL40-200-104
Excise Tax Memoranda (ETM)—QL Systems Limited: OL40-200-161
FCC Daily Tariff Log—NewsNet, Inc.: OL40-200-164
Index to CCH Loose-Leaf Publications—CCH Austrialia Limited: OL40-200-218
Index to Legal Periodicals—The H.W. Wilson Company: OL40-200-218
IRS Taxinfo—DIALOG Information Services, Inc.: OL40-200-143
Key Government Documents—Info Globe: OL40-300-106
NewsNet—NewsNet, Inc.: OL40-300-164
Nuova Fiscal Data—SIPE Optimation S.p.A.: OL40-300-174
PHINet FedTax—Prentice-Hall, Inc. (Information Services): OL40-300-201

Technology

DECHEMA—STN International (The Scientific and Technical Information Network): OL40-200-108
Energie—STN International (The Scientific and Technical Information Network): OL40-200-146
Financial Times Business Reports (FTBR)—Data-Star D-S Marketing, Inc.: OL40-200-172
High Tech International—NewsNet, Inc.: OL40-200-200
Hoppenstedt Messtechnik, Regelungstechnik, Automatik—Hoppenstedt Wirtschaftsdatenbank GmbH: OL40-200-204
Houston Chronicle—DataTimes Corp.: OL40-200-206
International Industrial Opportunities—NewsNet, Inc.: OL40-200-137
JICST File on Government Reports in Japan—Japan Information Center of Science and Technology: OL40-300-103
Los Angeles Daily News—VU/TEXT Information Services, Inc.: OL40-300-118
The Orange County Register—DataTimes Corp.: OL40-300-186
PTS New Product Announcements/PLUS (NPA/Plus)—Predicasts: OL40-300-215
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BNA California Case Law Daily—BNA Online: OL40-100-144
BNA's Alternative Dispute Resolution Report—BNA Online: OL40-100-148
Federal Judiciary Almanac—John Wiley & Sons, Inc.: OL40-200-139
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SEC & Business News—NewsNet, Inc.: OL40-400-106

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Science and Technology Databank (SCITECH)—University of Alberta, Computing Services: OL40-400-181
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State Fertilizer—Chase Econometrics: OL40-400-125
U.S. Food and Agriculture—Chase Econometrics: OL40-400-188
U.S. Census of Agriculture—On-Line Research Inc.: OL40-400-154
VETDOC—SDC Information Services: OL40-400-161
VIC (The Victory Garden)—Edward J. Batutis: OL40-400-162
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Wharton EFA Agricultural Model Database—Wharton Econometric Forecasting Associates: OL40-400-170
World Agriculture Supply and Disposition—Chase Econometrics: OL40-400-175

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Alcohol and Drug Related Information

Alcohol Use/Abuse (HAZE)—Bibliographic Retrieval Services, Inc.: OL40-100-111
DRUG (Drug Info)—Drug Information Services: OL40-200-117
Drug Info (DRUG)—Drug Information Services: OL40-200-117
HAZE (Alcohol Use/Abuse)—Bibliographic Retrieval Services, Inc.: OL40-100-111

Architecture

Avery Index to Architectural Periodicals—The Research Libraries Group, Inc.: OL40-100-127
CAN/MARC (Canadian Machine-Readable Cataloguing)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
Canadian Business Index (CBI)—QL Systems Limited: OL40-100-150
Canadian Machine-Readable Cataloguing (CAN/MARC)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
CBI (Canadian Business Index)—QL Systems Limited: OL40-100-150
Cecile—Questel, Inc.: OL40-100-161
Journal of the Society of Architectural Historians (JSAH)—Bibliographic Retrieval Services, Inc.: OL40-300-102
JSAH (Journal of the Society of Architectural Historians)—Bibliographic Retrieval Services, Inc.: OL40-300-102
Masterspec 2 (M2)—Production Systems for Architects & Engineers: OL40-300-120
M2 (Masterspec 2)—Production Systems for Architects & Engineers: OL40-300-120
Wiley Catalog/Online—John Wiley & Sons, Inc.: OL40-400-190

Arctic Research

Arctic Science and Technology Information System (ASTIS)—Arctic Institute of North America: OL40-100-120
ASTIS (Arctic Science and Technology Information System)—Arctic Institute of North America: OL40-100-120

Art Research

ART MODERN (ARTbibliographies Modern)—ABC-Clio Information Services: OL40-100-198
ARTbibliographies Modern (ART MODERN)—ABC-Clio Information Services: OL40-100-198
Arts Sales Catalog Database (SCIPIO)—The Research Libraries Group, Inc.: OL40-100-121
CAN/MARC (Canadian Machine-Readable Cataloguing)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
Canadian Machine-Readable Cataloguing (CAN/MARC)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
SCIPIO (Arts Sales Catalog Database)—The Research Libraries Group, Inc.: OL40-100-121

Asbestos Information

ASB (ASBESTOS)—Informathèque-PRAUS: OL40-100-121
ASBESTOS (ASB)—Informathèque-PRAUS: OL40-100-121

Audience Measurements

AMPS (South African Advertising Research Foundation)—Interactive Market Systems (IMS): OL40-400-120
BMRB-TGI (Target Group Index)—Interactive Market Systems (IMS): OL40-400-131
Etude IPSOS II Cadres—Informatique—Interactive Market Systems (IMS): OL40-200-139
Farm Audience Measurement Service (FARMS)—Interactive Market Systems (IMS): OL40-200-146
FARMS (Farm Audience Measurement Service)—Interactive Market Systems (IMS): OL40-200-146
Major Market Index (MMI)—Simmons Market Research Bureau, Inc.: OL40-300-115
Media Index Survey—Hong Kong—Interactive Market Systems (IMS): OL40-300-121
Media Index Survey—Indonesia—Interactive Market Systems (IMS): OL40-300-121
Media Index Survey—Malaysia—Interactive Market Systems (IMS): OL40-300-122
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NADB (National Audience Data Bank)—Interactive Market Systems (IMS): OL40-300-143
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National Study of Local Newspaper Ratings—Simmons Market Research Bureau, Inc.: OL40-300-149
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Newspaper Audience Data Bank (NADBANK)—Interactive Market Systems (IMS): OL40-300-154
Nielsen Station Index—Interactive Market Systems (IMS): OL40-300-156
Nielsen Television Index—Interactive Market Systems (IMS): OL40-300-156
NRS (National Readership Survey)—Interactive Market Systems (IMS): OL40-300-148
San Francisco Market—San Francisco Newspaper Agency: OL40-400-181
Scarborough Reports—Interactive Market Systems (IMS): OL40-400-104
Simmons Market Research Bureau (SMRB)—Simmons Market Research Bureau, Inc.: OL40-400-114
Simmons Teen Age Research Study (STARS)—Simmons Market Research Bureau, Inc.: OL40-400-114
SMM (Study of Media and Markets)—Simmons Market Research Bureau, Inc.: OL40-400-128
SMRB (Simmons Market Research Bureau)—Simmons Market Research Bureau, Inc.: OL40-400-114
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STARS (Simmons Teen Age Research Study)—Simmons Market Research Bureau, Inc.: OL40-400-114
Study of Media and Markets (SMM)—Simmons Market Research Bureau, Inc.: OL40-400-128
Target Group Index (BMRB-TGI)—Interactive Market Systems (IMS): OL40-400-131
Target Group Index, Major Market Index, and Target Teen Index—Simmons Market Research Bureau, Inc.: OL40-400-131
Three Sigma Major Market Newspaper Audiences—1980 (SIG)—Interactive Market Systems (IMS): OL40-400-140
Toronto Business Executives and Careers Study—Interactive Market Systems (IMS): OL40-400-142

Automotive

Automotive News Data Bank—Data Resources, Inc.: OL40-100-127
Battery Forecast—Chase Econometrics: OL40-100-132
Carline Specifications—Chase Econometrics: OL40-100-159
Ei Engineering Meetings—Engineering Information, Inc. (Ei): OL40-200-123

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Electric Vehicle Progress—Alexander Research and Publications, Inc.: OL40-200-125
International Auto Data Bank—Data Resources, Inc.: OL40-200-199
International Truck Data Bank—Data Resources, Inc.: OL40-200-205
New Pickup Truck Buyer Marketing & Media Study—Interactive Market Systems (IMS): OL40-300-150
Runzheimer Reports on Automotive Alternatives—NewsNet, Inc.: OL40-300-206
SAE Abstracts—Society of Automotive Engineers, Inc.: OL40-400-101
Wards Autoinfobank—Chase Econometrics: OL40-400-165

Aviation

Accident/Incident Data System (AIDS)—United Information Services Division: OL40-100-102
AIDS (Accident/Incident Data System)—United Information Services Division: OL40-100-102
AOPA Forum—CompuServe Incorporated: OL40-100-197
ASI (Aviation Safety Institute Information)—Aviation Safety Institute: OL40-100-127
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EMI Flight Planning—EMI Aerodata, Inc.: OL40-200-128
ER586 Service Segment—I.P. Sharp Associates Limited: OL40-200-138
Federal Aviation Administration Master Specifications—Bowne Information Systems, Inc.: OL40-200-147
Form 41 (FORM41)—I.P. Sharp Associates Limited: OL40-200-160
IATA North Atlantic Traffic—I.P. Sharp Associates Limited: OL40-200-180
ICAO Traffic Statistics—International Civil Aviation Organization (ICAO): OL40-200-182
OAND (Origin-Destination)—I.P. Sharp Associates Limited: OL40-300-171
Origin-Destination (OAND)—I.P. Sharp Associates Limited: OL40-300-171
Peak Delay Guide—Peak Delay Guide: OL40-300-176
SDR—United Information Services Division: OL40-400-105
T6 Air Charter—I.P. Sharp Associates Limited: OL40-400-130

Bibliographic Research

American Men and Women of Science (AMWS)—Jaques Cattell Press: OL40-100-114
AMWS (American Men and Women of Science)—Jaques Cattell Press: OL40-100-114
APL Bibliography (APLBIB)—I.P. Sharp Associates Limited: OL40-100-117
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Biography Master Index (BMI)—Gale Research Co.: OL40-100-135
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BMI (Biography Master Index)—Gale Research Co.: OL40-100-135
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BOREAL Codes—University of Alberta, Boreal Institute for Northern Studies Library: OL40-100-141
LC/Line—SDC Information Services: OL40-300-106
LC Marc—Dialog Information Services, Inc.: OL40-300-106
Marquis Who's Who—Marquis Who's Who: OL40-300-118
Monitor—SDC Information Services: OL40-300-138
Online Hotline—Information Intelligence Inc. (III): OL40-300-166
Research Libraries Information Network (RLIN)—The Research Libraries Group, Inc.: OL40-300-202
RLIN (Research Libraries Information Network)—The Research Libraries Group, Inc.: OL40-300-202
Yukon Bibliography—University of Alberta, Boreal Institute for Northern Studies Library: OL40-400-179

Bioethics

Bioethics On-line (BIOETHICSLINE)—National Library of Medicine, National Institutes of Health: OL40-100-134
BIOETHICSLINE (Bioethics On-line)—National Library of Medicine, National Institutes of Health: OL40-100-134

Biomedical Research Information

Aneuploidy—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-100-115
ISI/BIOMED—Institute for Scientific Information (ISI): OL40-200-208
MEDLINE—National Library of Medicine, National Institutes of Health: OL40-300-124
NAF (Name Authority File)—National Library of Medicine, National Institutes of Health: OL40-300-142
Name Authority File (NAF)—National Library of Medicine, National Institutes of Health: OL40-300-142
Population Bibliography—Carolina Population Center: OL40-300-185
SDILINE (Selective Dissemination of Information On-line)—National Library of Medicine, National Institutes of Health: OL40-400-108
Selective Dissemination of Information On-line (SDILINE)—National Library of Medicine, National Institutes of Health: OL40-400-108
Serials On-line (SERLINE)—National Library of Medicine, National Institutes of Health: OL40-400-109
SERLINE (Serials On-line)—National Library of Medicine, National Institutes of Health: OL40-400-109
Toxicology Information On-line (TOXLINE)—National Library of Medicine, National Institutes of Health: OL40-400-143
TOXLINE (Toxicology Information On-line)—National Library of Medicine, National Institutes of Health: OL40-400-143

Biotechnology Related Information

BIOT (Biotechnology)—SDC Information Services: OL40-100-136
Biotechnology (BIOT)—SDC Information Services: OL40-100-136
Current Biotechnology Abstracts—The Royal Society of Chemistry Information Services: OL40-100-207
Telegenline—EIC/Intelligence, Inc.: OL40-400-136

Birth Defects

BDIS (Birth Defects Information System)—Center for Birth Defects Information Services: OL40-100-136
Birth Defects Information System (BDIS)—Center for Birth Defects Information Services: OL40-100-136

Boating Information

BUCFAX—BUC International Corporation: OL40-100-143

Bonds

Bondata—FRI Information Services Limited: OL40-100-139
C-Port—Interactive Data Services, Inc.: OL40-100-146
Canadian Bond (CDNBOND)—I.P. Sharp Associates Limited: OL40-100-149
CDNBOND (Canadian Bond)—I.P. Sharp Associates Limited: OL40-100-149
COMMBOND (Commonwealth Bank Bond Index)—I.P. Sharp Associates Limited: OL40-100-179
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IBQ (Institutional Bond Quote Service)—Interactive Data Services, Inc.: OL40-200-196
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Securities Database—Gregg Corporation: OL40-400-106
Tymquote Securities Database—Tymshare, Inc.: OL40-400-148
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Budget Systems

Budgetrack—Data Resources, Inc.: OL40-100-143
Budgetscope—Data Resources, Inc. (DRI): OL40-100-200

Business and Strategic Planning

BI/CAS (Business International Country Assessment Service)—Business International Corporation: OL40-100-145
Business International Country Assessment Service (BI/CAS)—Business International Corporation: OL40-100-145
CITIBASE—Citibase, Citicorp Information Services: OL40-100-171
European Data Bank—Data Resources, Inc.: OL40-200-140
External Debt Data Base—Data Resources, Inc.: OL40-200-144
FIN (Financial Database)—Evans Economics, Inc.: OL40-200-151
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MLEFOR (National Short-Term Forecast)—Merrill Lynch Economics, Inc.: OL40-300-148
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New York City Data Bank—Data Resources, Inc.: OL40-300-150
Trinet Establishment Database—Trinet, Inc.: OL40-400-185

Business Related Database Categories

Allentown Morning Call—VU/TEXT Information Services: OL40-100-111
ARA (PTS Annual Reports Abstracts)—Predicasts, Inc.: OL40-300-191
Arthur D. Little/Online—Arthur D. Little, Inc.: OL40-100-198
BIZDATE—Source Telecomputing Corporation: OL40-100-137
Buy-Phone—Buy-Phone, Inc: OL40-100-146
CALURA—Canada Systems Group: OL40-100-148
Canadian Business and Current Affairs—Dialog Information Services, Inc.: OL40-100-201
Canadian Federal Corporations and Directors (CFCD)—Canada Systems Group: OL40-100-152
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D & B—Principal International Businesses—Dialog Information Services, Inc.: OL40-200-101
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F&S Political Risk Letter—NewsNet, Inc.: OL40-200-144
Financial Times of London (FINTEL)—Bibliographic Retrieval Services, Inc.: OL40-200-154
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ISIS New Electronic Media Newswire—NewsNet, Inc.: OL40-200-209
Japan Economic Daily's Kyodo News—Dow Jones News/Retrieval Service: OL40-300-101
Management and Marketing Abstracts—Pergamon InfoLine Inc.: OL40-300-115

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Midwest Technology—NewsNet, Inc.: OL40-300-133
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Singapore Corporate Statistics—I.P. Sharp Associates Limited: OL40-400-115
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Wall Street Transcript—VU/TEXT Information Services: OL40-400-164
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World Affairs Report—Dialog Information Services, Inc.: OL40-400-175

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Cancer Literature (CANCERLIT)—National Cancer Institute, Scientific Information Branch: OL40-100-155
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Cancer Therapy Protocols (CLINPROT)—National Cancer Institute, Scientific Information Branch: OL40-100-156
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Career Guidance

Career Placement Registry/Experienced Personnel (CPR/EP)—Dialog Information Services, Inc.: OL40-100-159
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GIS (Guidance Information System)—Houghton Mifflin, TSC Division: OL40-200-170
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C*Line (Carpet Information Network)—Source Telecomputing Corporation: OL40-100-200
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Census and Utilization Review

A Classification of Residential Neighborhoods (ACORN)—CACI, Inc.—Federal: OL40-100-195
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The Convenience Store Potential—CACI, Inc.—Federal: OL40-100-207
Demographic Online Retrieval Information System (DORIS)—CACI, Inc.—Federal: OL40-200-114
DORIS (Demographic Online Retrieval Information System)—CACI, Inc.—Federal: OL40-200-114
MarketPotential—Donnelley Marketing Information Services: OL40-300-117
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National Planning Association United States Demographic Data (NPADEMOG)—I.P. Sharp Associates Limited: OL40-300-147

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Telephone Exchange and Area Code Database—CACI, Inc.—Federal: OL40-400-184

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Canadian 1981 Agricultural Census—I.P. Sharp Associates Limited: OL40-100-154
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CensusPlus—Donnelley Marketing Information Services: OL40-100-162
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DRI/NPDC (U.S. Census 1980)—Data Resources, Inc.: OL40-400-154
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U.S. Census Report—NewsNet, Inc.: OL40-400-154
Zip—Demographics—CACI, Inc.—Federal: OL40-400-192

Chemicals

Plastic Chemicals (PLASTICS)—Probe Economics, Inc.: OL40-300-183
Plastic Chemicals Forecast Database (PLASA/PLASB)—Probe Economics, Inc.: OL40-300-183

Chemistry Related Information

American Chemical Society Primary Journal (CFTX)—Bibliographic Retrieval Services, Inc.: OL40-100-114
AQUA—General Electric Information Services Co. (GEISCO): OL40-100-118
CA Condensates (CAC)—Chemical Abstracts Service: OL40-100-200
Canadian Fertilizer (CAFERT)—Chase Econometrics: OL40-100-153
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CESARS (Chemical Evaluation Search and Retrieval System)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-165
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Historical Averages—Dow Jones News/Retrieval Service: OL40-200-176
ICARUS—Zacks Investment Research: OL40-200-182
INV (Investment News & Views)—Battery Lane Publications: OL40-200-207
Investment News & Views (INV)—Battery Lane Publications: OL40-200-207
Merlin—Hale Systems, Inc. Remote Computing Division: OL40-300-126

Investor Relations

Corporate Shareholder—NewsNet, Inc.: OL40-100-188

Job Recruitment

Career Placement Registry/Student—Career Placement Registry, Inc.: OL40-100-159
Direct Connection—CompuServe Incorporated: OL40-200-109
Online Careers—Information Intelligence Inc. (III): OL40-300-165

Labor Force Information

Bi/Data Time Series—Business International Corporation: OL40-100-200
BLS Employment, Hours, and Earnings—Dialog Information Services, Inc.: OL40-100-138
BLS Labor Force—Dialog Information Services, Inc.: OL40-100-138
Chemlaw—The Bureau of National Affairs, Inc. (BNA): OL40-100-167
Household Age/Income Forecast—Chase Econometrics: OL40-200-178
Laborlaw—The Bureau of National Affairs, Inc. (BNA): OL40-300-104
Labourdoc—SDC Information Services: OL40-300-104
New York Regional Economic Database—National Data Corporation (NDC): OL40-300-150
Orr System of Construction Cost Management—Constech, Inc.: OL40-300-171

Language Translation

Language and Language Behavior Abstracts (LLBA)—Dialog Information Services, Inc.: OL40-300-105
Language Catalog—University of Alberta, Computing Services: OL40-300-105
LLBA (Language and Language Behavior Abstracts)—Dialog Information Services, Inc.: OL40-300-105
MLA International Bibliography (MLAB)—Modern Language Association of America: OL40-300-136
MLAB (MLA International Bibliography)—Modern Language Association of America: OL40-300-136
Slavic Philology (SLAVICA)—University of Alberta, Computing Services: OL40-400-117
SLAVICA (Slavic Philology)—University of Alberta, Computing Services: OL40-400-117

Subject Index

Smart Translator (SMARTRANS)—Smart Communications, Inc.: OL40-400-117
SMARTRANS (Smart Translator)—Smart Communications, Inc.: OL40-400-117

Law and Taxation

ABI/INFORM—Data Courier Inc.: OL40-100-101

Legal Documents and Publications

APR (Atlantic Province Reports)—Canadian Law Information Council: OL40-100-122
Atlantic Province Reports (APR)—Canadian Law Information Council: OL40-100-122
DLR (Dominion Law Reports)—QL Systems Limited: OL40-200-114
Dominion Law Reports (DLR)—QL Systems Limited: OL40-200-114
FCR (Federal Court of Canada Reports)—QL Systems Limited: OL40-200-147
Federal Court of Canada Reports (FCR)—QL Systems Limited: OL40-200-147
JURIS (Justice Retrieval and Inquiry System)—US Department of Justice, Information Systems Staff: OL40-300-102
Justice Retrieval and Inquiry System (JURIS)—US Department of Justice, Information Systems Staff: OL40-300-102
Legal Resource Index (LRI)—Information Access Company: OL40-300-107
Les Rapports de la Cour Federale du Canada (RCF)—QL Systems Limited: OL40-300-108
Les Rapports de la Cour Supreme du Canada (RCS)—QL Systems Limited: OL40-300-108
Les Statutus Revises du Canada (SRC)—QL Systems Limited: OL40-300-108
LRI (Legal Resource Index)—Information Access Company: OL40-300-107
RCF (Les Rapports de la Cour Federale du Canada)—QL Systems Limited: OL40-300-108
RCS (Les Rapports de la Cour Supreme du Canada)—QL Systems Limited: OL40-300-108
RSO (Statutes of Ontario)—QL Systems Limited: OL40-400-127
SAC (Statutes of Alberta Citator)—QL Systems Limited: OL40-400-126
SBC (Statutes of British Columbia)—QL Systems Limited: OL40-400-126
SCR (Supreme Court Reports)—QL Systems Limited: OL40-400-129
SNB (Statutes of New Brunswick)—Translation/Compu. Branch Law Reform Div., Off. of Atty. General: OL40-400-127
SRC (Les Statutus Revises du Canada)—QL Systems Limited: OL40-300-108
Statutes of Alberta Citator (SAC)—QL Systems Limited: OL40-400-126
Statutes of British Columbia (SBC)—QL Systems Limited: OL40-400-126
Statutes of New Brunswick (SNB)—Translation/Compu. Branch Law Reform Div., Off. of Atty. General: OL40-400-127
Statutes of Ontario (RSO)—QL Systems Limited: OL40-400-127
Supreme Court Reports (SCR)—QL Systems Limited: OL40-400-129
WESTLAW—West Publishing Company: OL40-400-169

Legislative Bill Information

Alberta Legislative Information (ALI)—University of Alberta, Computing Services: OL40-100-110
ALI (Alberta Legislative Information)—University of Alberta, Computing Services: OL40-100-110
Bill Status System—Legislative Information System: OL40-100-134
Congressional Digest—NewsNet, Inc.: OL40-100-184
Electronic Legislative Search System (ELSS)—Commerce Clearing House, Inc.: OL40-200-126
ELSS (Electronic Legislative Search System)—Commerce Clearing House, Inc.: OL40-200-126
Legi-Slate—Legi-Slate, Inc.: OL40-300-107
Legislative Intelligence Week—NewsNet, Inc.: OL40-300-108
OLIS (Oregon Legislative Information System)—Legislative Administrative Committee: OL40-300-170
Oregon Legislative Information System (OLIS)—Legislative Administrative Committee: OL40-300-170
Process—Questel, Inc.: OL40-300-188
Votes—Canada Systems Group: OL40-400-163

Library Information Systems

BOREAL—University of Alberta, Boreal Institute for Northern Studies Library: OL40-100-141
California Union List of Periodicals (CULP)—Cooperative Library Agency for Systems and Services (CLASS): OL40-100-148
CAS Source Index (CASSI)—Chemical Abstracts Service: OL40-100-160
CASSI (CAS Source Index)—Chemical Abstracts Service: OL40-100-160
CISTI Current Catalog—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-171
CULP (California Union List of Periodicals)—Cooperative Library Agency for Systems and Services (CLASS): OL40-100-148
ELIAS (Environmental Libraries Automated System)—Environment Canada, Departmental Library: OL40-200-136
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Library and Information Science Abstracts (LISA)—Dialog Information Services, Inc.: OL40-300-110
LISA (Library and Information Science Abstracts)—Dialog Information Services, Inc.: OL40-300-110
New York Times Consumer Library—Source Telecomputing Corporation: OL40-300-151
NUC/Codes—SDC Information Services: OL40-300-159
OLUC (On-line Union Catalog)—OCLC Online Computer Library Center, Inc.: OL40-300-165
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UNION (Union List of Scientific Serials in Canadian Libraries)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-149
Union List of Scientific Serials in Canadian Libraries (UNION)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-149
Universal Serials and Book Exchange (USBE)—Universal Serials & Book Exchange, Inc.: OL40-400-152
USBE (Universal Serials and Book Exchange)—Universal Serials & Book Exchange, Inc.: OL40-400-152
WLN Database—Washington Library Network: OL40-400-174

Library Related Information

Associations' Publications in Print—R. R. Bowker Company: OL40-100-199
CANUCS (Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-188
Catalogue Support System (CATSS Database)—Utlas Inc.: OL40-100-203
CATSS Database (Catalogue Support System)—Utlas Inc.: OL40-100-203
Charging for Library Services—QL Systems Limited: OL40-100-163
Data Library—University of Alberta, Computing Services: OL40-200-103
Datalib Resources—University of Alberta, Computing Services: OL40-200-103
Library—University of Alberta, Computing Services: OL40-300-110
RLG Conspectus On-line—The Research Libraries Group, Inc.: OL40-300-205

Subject Index

Science and Technology Databank (SCITECH)—University of Alberta, Computing Services: OL40-400-181
SCITECH (Science and Technology Databank)—University of Alberta, Computing Services: OL40-400-181
Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries (CANUCS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-188

Life Sciences

Aerospace Database—American Institute of Aeronautics and Astronautics—Technical Info. Svc.: OL40-100-106
INIS (International Nuclear Information System)—Canada Institute for Scientific and Technical Information (CISTI): OL40-200-203
International Nuclear Information System (INIS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-200-203
Life Sciences Collection—Cambridge Scientific Abstracts: OL40-300-110

Lithium Related Information

Lithium Library—Lithium Information Center, Dept. of Psychiatry—Univ. of Wis.—Madison: OL40-300-111

Livestock

Agricultural Forecast Database—Evans Economics, Inc.: OL40-100-107
Agriculture Database—Evans Economics, Inc.: OL40-100-108
CANSIM Canadian Agriculture—Chase Econometrics: OL40-100-158
Horse—Bloodstock Research Information Services, Inc.: OL40-200-178

Loan Processing

Eurodata Syndicated Loan Database—Chase Econometrics: OL40-200-139

Macroeconomics

Bi/Data Time Series—Business International Corporation: OL40-100-200
Canadian Macroeconomic Forecast—Chase Econometrics: OL40-100-153
Citiforecast—I.P. Sharp Associates Limited: OL40-100-171
Consumer Spending Forecast—Chase Econometrics: OL40-100-186
Insight: Monthly Economic Report—NewsNet, Inc.: OL40-200-194
Macroeconomic Forecast—Chase Econometrics: OL40-300-114
Nomura Research Institute Data Base-Japan (NRI)—Chase Econometrics: OL40-300-156
NRI (Nomura Research Institute Data Base-Japan)—Chase Econometrics: OL40-300-156
OECD Economic Outlook—Data Resources, Inc. (DRI): OL40-300-160
Regional Forecasting Service—Evans Economics, Inc.: OL40-300-199
Regional Forecast—Chase Econometrics: OL40-300-199
Republic of China (Taiwan)—Chase Econometrics: OL40-400-131
Taiwan (Republic of China)—Chase Econometrics: OL40-400-131

Management Sciences

Arthur D. Little/Online—Arthur D. Little, Inc.: OL40-100-198

Marine Studies

Aquaculture—Dialog Information Services, Inc.: OL40-100-118
Aquatic Sciences and Fisheries Abstracts (ASFA)—QL Systems Limited: OL40-100-119
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Oceanographic Literature Review—Pergamon InfoLine Inc.: OL40-300-160
SC (Ships Characteristics)—Maritime Data Network, Ltd.: OL40-400-112
Ship Abstracts—Samson Data Systemen BV: OL40-400-111
Ship Movement Library (SM)—Maritime Data Network, Ltd.: OL40-400-112
Ships Characteristics (SC)—Maritime Data Network, Ltd.: OL40-400-112
SM (Ship Movement Library)—Maritime Data Network, Ltd.: OL40-400-112

Market Analysis

APS Review—NewsNet, Inc.: OL40-100-118
Insight: Monthly Economic Report—NewsNet, Inc.: OL40-200-194
ISIS New Electronic Media Newswire—NewsNet, Inc.: OL40-200-209
OECD Indicators of Industrial Activity—Chase Econometrics: OL40-300-161
Strategic Planning Institute PIMS—Data Resources, Inc. (DRI): OL40-400-183

Market and Media Planning

Australia-Wide Survey of Readership of Magazines—Interactive Market Systems (IMS): OL40-100-126
BARB (Broadcasters Audience Research Board)—Interactive Market Systems (IMS): OL40-100-143
Broadcasters Audience Research Board (BARB)—Interactive Market Systems (IMS): OL40-100-143

Market Research

ABI/INFORM—Data Courier Inc.: OL40-100-101
ACR (Annex Computer Report)—NewsNet, Inc.: OL40-100-116
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ARA (PTS Annual Reports Abstracts)—Predicasts, Inc.: OL40-300-191
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CODE (Cable Online Data Exchange)—A.C. Nielsen Company: OL40-100-201
Energy—Probe Economics, Inc.: OL40-200-131
General Chemical Indicators (GENCHEM)—Probe Economics, Inc.: OL40-200-163
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MRI Business to Business—Mediamark Research Inc.: OL40-300-141

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NADBANK (Newspaper Audience Data Bank)—Interactive Market Systems (IMS): OL40-300-154
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PTS Annual Reports Abstracts (ARA)—Predicasts, Inc.: OL40-300-191
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San Francisco Market—San Francisco Newspaper Agency: OL40-400-181
Site•Potential—CACI, Inc.—Federal: OL40-400-116
Standard & Poor's Corporate Descriptions—Dialog Information Services, Inc.: OL40-400-183
Target Group Index, Major Market Index, and Target Teen Index—Simmons Market Research Bureau, Inc.: OL40-400-131
Three Sigma Major Market Newspaper Audiences—1980 (SIG)—Interactive Market Systems (IMS): OL40-400-140
Trinet Industrial Plants—Trinet, Inc.: OL40-400-185
U.S. Economic Forecast Data Base—Probe Economics, Inc.: OL40-400-188
VALS (Values & Lifestyles Program)—SRI International: OL40-400-161
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World Petrochemicals Program (WP DATA)—SRI International: OL40-400-177
WP DATA (World Petrochemicals Program)—SRI International: OL40-400-177

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A Classification of Residential Neighborhoods (ACORN)—CACI, Inc.—Federal: OL40-100-195
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AGMA (Arbeitsgemeinschaft Media-Analyse)—Interactive Market Systems (IMS): OL40-100-119
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CFD (Consumer Financial Decisions)—I.P. Sharp Associates Limited: OL40-100-206
Consumer Financial Decisions (CFD)—I.P. Sharp Associates Limited: OL40-100-206
Dun's Quest—Duns Marketing Services: OL40-200-118
Engineering Literature Index—Engineering Information, Inc. (Ei): OL40-200-134
IDB (International Data Base)—US Bureau of the Census: OL40-200-200
Innovator's Digest—NewsNet, Inc.: OL40-200-192
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Telephone Exchange and Area Code Database—CACI, Inc.—Federal: OL40-400-184
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TVPlus—Interactive Market Systems (IMS): OL40-400-186

Marketing Program Services

Adtrack—Corporate Intelligence, Inc.: OL40-100-104
D & B—Dun's Market Identifiers (DMI)—Duns Marketing Services: OL40-200-101
DMI (D & B—Dun's Market Identifiers)—Duns Marketing Services: OL40-200-101
Harfax Industry Data Sources (IDS)—Harfax Database Publishing: OL40-200-171
IDS (Harfax Industry Data Sources)—Harfax Database Publishing: OL40-200-171
M.D.D. (Million Dollar Directory)—Duns Marketing Services: OL40-300-133
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X/Market—Trinet, Inc.: OL40-400-178

Medical Literature

Catalog On-line (CATLINE)—National Library of Medicine, National Institutes of Health: OL40-100-160
CATLINE (Catalog On-line)—National Library of Medicine, National Institutes of Health: OL40-100-160
EMBASE (Excerpta Medica Database)—Excerpta Medica, Inc.: OL40-200-142
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International Pharmaceutical Abstracts (IPA)—American Society of Hospital Pharmacists: OL40-200-204
IPA (International Pharmaceutical Abstracts)—American Society of Hospital Pharmacists: OL40-200-204
Pre-Med (PREM)—Bibliographic Retrieval Services, Inc.: OL40-300-187
PREM (Pre-Med)—Bibliographic Retrieval Services, Inc.: OL40-300-187
Serials On-line (SERLINE)—National Library of Medicine, National Institutes of Health: OL40-400-109
SERLINE (Serials On-line)—National Library of Medicine, National Institutes of Health: OL40-400-109

Medical Rehabilitation Information

NARIC (NRIC)—Bibliographic Retrieval Services, Inc.: OL40-300-142
National Information Center for Special Education Materials (NIMI)—National Information Center for Educational Media: OL40-300-146
National Information Sources on the Handicapped (NISH)—Clearinghouse on the Handicapped, U.S. Dept. of Education: OL40-300-146
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NRIC (NARIC)—Bibliographic Retrieval Services, Inc.: OL40-300-142
Rehabdata—National Rehabilitation Information Center: OL40-300-200

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Mental Health Information

Mental Health Abstracts (NIMH)—IFI/Plenum Data Co.: OL40-300-125
Mental Measurements Yearbook (MMYD)—Buros Institute of Mental Measurements: OL40-300-125
MMYD (Mental Measurements Yearbook)—Buros Institute of Mental Measurements: OL40-300-125
NIMH (Mental Health Abstracts)—IFI/Plenum Data Co.: OL40-300-125

Metallurgy

Zinc, Lead and Cadmium Abstracts (ZLC)—Pergamon InfoLine Inc.: OL40-400-180
ZLC (Zinc, Lead and Cadmium Abstracts)—Pergamon InfoLine Inc.: OL40-400-180

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AERIC Steel Products Databank—The Conference Board of Canada: OL40-100-105
Aluminum Forecasts—Chase Econometrics: OL40-100-112
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Base Metals—Chase Econometrics: OL40-100-131
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BNF Metals (Nonferrous Metals Abstracts)—Dialog Information Services, Inc.: OL40-300-157
BNF Non-Ferrous Metals Abstracts—BNF Metals Technology Centre: OL40-100-139
Cambridge Crystallographic (CRYSTOR)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-148
Corrosion—SDC Information Services: OL40-100-207
CRU Lead/Zinc/Silver Cost Model—CRU Consultants, Inc.: OL40-100-192
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Ferroalloys and Strategic Metals Forecast—Chase Econometrics: OL40-200-149
International Lead and Zinc Study Group—Chase Econometrics: OL40-200-203
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U.S. Imports of Iron and Steel—Chase Econometrics: OL40-400-156
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Zinc, Lead and Cadmium Abstracts (ZLC)—Pergamon InfoLine Inc.: OL40-400-180
ZLC (Zinc, Lead and Cadmium Abstracts)—Pergamon InfoLine Inc.: OL40-400-180

Microcomputer Information

Advanced Computing—NewsNet, Inc.: OL40-100-104
Computer Insider—NewsNet, Inc.: OL40-100-182
Home Computer News—NewsNet, Inc.: OL40-200-178
Menu—International Software Database Corp.: OL40-300-125
Microcomputer Index—Database Services, Inc.: OL40-300-129
Microline—Source Telecomputing Corporation: OL40-300-130
Online Microcomputer Software Guide and Directory—Bibliographic Retrieval Services, Inc.: OL40-300-166
Personal Computers Today—NewsNet, Inc.: OL40-300-177
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Drill Hole Data Base—CompuServe Incorporated: OL40-200-116
Geode—Questel, Inc.: OL40-200-164
Mineral Processing (MINPROC)—Canada Centre for Mineral & Energy Technology: OL40-300-134
MINPROC (Mineral Processing)—Canada Centre for Mineral & Energy Technology: OL40-300-134

Mining and Mineral Exploration

Drill Hole Data Base—CompuServe Incorporated: OL40-200-116
E&MR (Energy and Mineral Resources)—NewsNet, Inc.: OL40-200-131
Energy and Mineral Resources (E&MR)—NewsNet, Inc.: OL40-200-131
Geoarchive—Geosystems: OL40-200-164
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Minerals Data System (MOS)—University of Oklahoma, Information Systems Programs (ISP): OL40-300-134
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MOS (Minerals Data System)—University of Oklahoma, Information Systems Programs (ISP): OL40-300-134

Money Management

CDA Online Services—Computer Directions Advisors, Inc.: OL40-100-161

Money Supply and Debt

European Economic Indicators—ADP Network Services: OL40-200-140
External Debt Data Base—Data Resources, Inc.: OL40-200-144
Fedwatch—NewsNet, Inc.: OL40-200-149
U.S. Financial—ADP Network Services: OL40-400-156
WDEBT (World Bank Debt Tables)—I.P. Sharp Associates Limited: OL40-400-175
World Bank Debt Tables (WDEBT)—I.P. Sharp Associates Limited: OL40-400-175

Mortgage Information

Banker—SDC Information Services: OL40-100-130
GNMAX—Control Data Corp., Business Information Services: OL40-200-166
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U.S. Regional Data Bank—Data Resources, Inc.: OL40-400-158

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Motor Vehicle Registrations—Computer Sciences of Australia Pty. Ltd.: OL40-300-140

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Music Research

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CRIS/USDA (Current Research Information System)—Dialog Information Services, Inc.: OL40-100-193
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SCISearch—Institute for Scientific Information (ISI): OL40-400-105
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News Media

The Associated Press Political Service—Mead Data Central: OL40-100-199

News Summaries

Allentown Morning Call—VU/TEXT Information Services: OL40-100-111
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Canadian Business and Current Affairs—Dialog Information Services, Inc.: OL40-100-201
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Facts on File—Dialog Information Services, Inc.: OL40-200-145
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TODAY (formerly, News Summaries—New York Times)—Mead Data Central: OL40-400-142
United Press International (UPI)—NewsNet, Inc.: OL40-400-150
UPI (United Press International)—NewsNet, Inc.: OL40-400-150
Wall Street Journal Online—Dow Jones News/Retrieval Service: OL40-400-164
Wall Street Transcript—VU/TEXT Information Services: OL40-400-164
Washington Post Index—Dialog Information Services, Inc.: OL40-400-165

Northern Studies

BOREAL (Boreal Library Catalogue)—University of Alberta, Boreal Institute for Northern Studies Library: OL40-100-141
Boreal Library Catalogue (BOREAL)—University of Alberta, Boreal Institute for Northern Studies Library: OL40-100-141
Cold—SDC Information Services: OL40-100-177

Nuclear Engineering

Energi—Questel, Inc.: OL40-200-130

Nuclear Related Information

Carbon-13 Nuclear Magnetic Resonance Spectral Search System (CNMR)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-158
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DOSAGE (Dosimetry of Special and General Employees)—Creative Information Systems: OL40-200-115
Dosimetry of Special and General Employees (DOSAGE)—Creative Information Systems: OL40-200-115
Engineering Literature Index—Engineering Information, Inc. (Ei): OL40-200-134
IHPD (International Health Physics Database)—Creative Information Systems: OL40-200-202
INIS (International Nuclear Information System)—Canada Institute for Scientific and Technical Information (CISTI): OL40-200-203
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International Nuclear Information System (INIS)—Canada Institute for Scientific and Technical Information (CISTI): OL40-200-203
Nuclear Waste News—NewsNet, Inc.: OL40-300-159
Power Data Base—Utility Data Institute: OL40-300-186
Radiation Shielding Computer Codes (RSC)—Oak Ridge National Laboratory, Radiation Shielding Information (RSI): OL40-300-195
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Nutrition

Better Homes and Gardens/Cook's Underground—CompuServe Incorporated: OL40-100-132
Electronic Gourmet—Home Management Systems Inc.: OL40-200-126

Occupational Health and Safety

ASI (Aviation Safety Institute Information)—Aviation Safety Institute: OL40-100-127
Aviation Safety Institute Information (ASI)—Aviation Safety Institute: OL40-100-127
CIS—Questel, Inc.: OL40-100-170
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Compliance Alert: Federal Register Digest—NewsNet, Inc.: OL40-100-181
DOSAGE (Dosimetry of Special and General Employees)—Creative Information Systems: OL40-200-115
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Environmental Health News—Occupational Health Services, Inc.: OL40-200-136
Hazardline—Occupational Health Services, Inc.: OL40-200-172
HSELINE—European Space Agency—Information Retrieval Service: OL40-200-179
IHPD (International Health Physics Database)—Creative Information Systems: OL40-200-202
International Health Physics Database (IHPD)—Creative Information Systems: OL40-200-202
Laboratory Hazards Bulletin—Pergamon InfoLine Inc.: OL40-300-104
Laborlaw—The Bureau of National Affairs, Inc. (BNA): OL40-300-104
Occupational Safety and Health Database—International Occupational Safety and Health Information Centre (CIS): OL40-300-159
Safety—SDC Information Services: OL40-400-101

Ocean Engineering

Oceanographic Literature Review—Pergamon InfoLine Inc.: OL40-300-160

Oceanography

Aquatic Sciences and Fisheries Abstracts (ASFA)—QL Systems Limited: OL40-100-119
Aquatic Sciences and Fisheries (ASFA)—Cambridge Scientific Abstracts: OL40-100-119
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Office Automation

Altman & Weil Report to Legal Management—NewsNet, Inc.: OL40-100-111
Executive Productivity—NewsNet, Inc.: OL40-200-143
FACS (First Analysis Corporation System)—First Analysis Corporation (FACS): OL40-200-156
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Office Automation Update—NewsNet, Inc.: OL40-300-162
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Oil and Gas Exploration

Drilling Analysis Data On-line—Petroleum Information Corporation: OL40-200-116
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Organic Related Information

Cambridge Crystallographic (CRYSTOR)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-148
CRYSTOR (Cambridge Crystallographic)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-148

Packaging Legislation

Paklegis—Pergamon InfoLine Inc.: OL40-300-173
Pira—Pergamon InfoLine Inc.: OL40-300-182

Patents

APIPAT—American Petroleum Institute, Central Abstracting & Indexing Service: OL40-100-117
Chemlaw—The Bureau of National Affairs, Inc. (BNA): OL40-100-167
Claims/Chem—IFI/Plenum Data Co.: OL40-100-171
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Patlaw (USPQ)—The Bureau of National Affairs, Inc. (BNA): OL40-300-175

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PATS (PATDATA)—Bibliographic Retrieval Services, Inc.: OL40-300-174
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CDA Online Services—Computer Directions Advisors, Inc.: OL40-100-161

Periodicals Directory Data

Bowker Serials Bibliography Database—R. R. Bowker Company: OL40-100-142
CANUCS (Union List of Serials in the Social Sciences and Humanities Held by Canadian Libraries)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-188
COMPENDEX (Computerized Engineering Index)—Engineering Information, Inc. (Ei): OL40-100-183
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Ebsconet—EBSCO Subscription Services: OL40-200-119
Infoserv—F.W. Faxon Co., Inc.: OL40-200-191
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TIC Serial Titles—US Department of Energy, Office of Scientific and Technical Information: OL40-400-141
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UNION (Union List of Scientific Serials in Canadian Libraries)—Canada Institute for Scientific and Technical Information (CISTI): OL40-400-149
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Petrochemical

EPCA (European Petrochemicals Association)—Unilever Computer Services Ltd: OL40-200-141
European Petrochemicals Association (EPCA)—Unilever Computer Services Ltd: OL40-200-141
ICIS (Independent Chemical Information Services)—I.P. Sharp Associates Limited: OL40-200-186
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Petroleum

Active Well Data On-line—Petroleum Information Corporation: OL40-100-103
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APIDIST (Monthly Report of Heating Oil & Middle Distillates)—I.P. Sharp Associates Limited: OL40-300-139
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ARGREP (Petroleum Argus Daily Market Report)—I.P. Sharp Associates Limited: OL40-300-179
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Canadian Retail Gas Volume (KENTV)—I.P. Sharp Associates Limited: OL40-100-203
DAAS (Drilling Activity Analysis System)—Petroleum Information Corporation: OL40-200-116
Daily Petro News—NewsNet, Inc.: OL40-200-102
Dewitt Petrochemical Newsletter—I.P. Sharp Associates Limited: OL40-200-107
DIS (Drilling Information Services)—Adams and Roundtree Technology, Inc.: OL40-200-116
DOLS (Dwight's On-Line System)—Dwight's Energydata, Inc.: OL40-200-118
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Ei Engineering Meetings—Engineering Information, Inc. (Ei): OL40-200-123
Electronic Rig Stats (Offshore-1Mobile Rigs)—PennWell Publishing Co.: OL40-200-127
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IMPORTS (United States Petroleum Imports)—I.P. Sharp Associates Limited: OL40-400-151
International Coal Trade—Chase Econometrics: OL40-200-200
International Petroleum Annual (IPA)—I.P. Sharp Associates Limited: OL40-200-204
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KENTV (Canadian Retail Gas Volume)—I.P. Sharp Associates Limited: OL40-100-203
Liquified Petroleum Gas Report (LPGAS)—Canadian Law Information Council: OL40-300-111
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Lundberg Share of Market (SOM)—I.P. Sharp Associates Limited: OL40-300-113

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Monthly Report of Heating Oil & Middle Distillates (API-DIST)—I.P. Sharp Associates Limited: OL40-300-139
OECD Quarterly Oil Statistics—I.P. Sharp Associates Limited: OL40-300-162
Offshore-1Mobile Rigs (Electronic Rig Stats)—PennWell Publishing Co.: OL40-200-127
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P/E NEWS—American Petroleum Institute, Central Abstracting & Indexing Service: OL40-300-172
PDS (Petroleum Data System)—University of Oklahoma, Information Systems Programs (ISP): OL40-300-180
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Petrochemicals Forecast Data Base (PETA/PETB)—Probe Economics, Inc.: OL40-300-178
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Production Database—Petroleum Information Corporation: OL40-300-189
Retail Price (RETAIL)—I.P. Sharp Associates Limited: OL40-300-204
Retail Price Survey—Lundberg Survey Inc.: OL40-300-204
Search—Computer Sciences Corporation: OL40-400-105
SOM (Lundberg Share of Market)—I.P. Sharp Associates Limited: OL40-300-113
TULSA—University of Tulsa; Information Services Division: OL40-400-148
U.S. Energy Forecast—Chase Econometrics: OL40-400-187
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Weekly Statistical Bulletin (WSB)—I.P. Sharp Associates Limited: OL40-400-168
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WSB (Weekly Statistical Bulletin)—I.P. Sharp Associates Limited: OL40-400-168

Pharmaceutical Industry Information

AMA/NET Drug Information Base—American Medical Association: OL40-100-112
Controlled-Release Database—Technology Catalysts Inc.: OL40-100-187
DIF (Drug Information Fulltext)—American Society of Hospital Pharmacists: OL40-200-117
Drug Facts and Comparisons (F & C)—Harfax Database Publishing: OL40-200-117
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Martindale Online—Bibliographic Retrieval Services, Inc.: OL40-300-119
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OPTDAT (PNI Pharmaceutical News Index—Data Courier Inc.)—National Computer Network of Chicago: OL40-300-180
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PHYCOM (Physician Communications)—GTE Telenet: OL40-300-182
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SDF (Standard Drug File)—SDC Information Services: OL40-400-123
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TDB (Toxicology Data Bank)—National Library of Medicine, National Institutes of Health: OL40-400-143
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Philosophy

CAN/MARC (Canadian Machine-Readable Cataloguing)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
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Philosopher's Index—Philosophy Documentation Center: OL40-300-181

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Aerospace Database—American Institute of Aeronautics and Astronautics—Technical Info. Svc.: OL40-100-106
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INSPEC—INSPEC (Institution of Electrical Engineers): OL40-200-195
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Searchable Physics Information Notices (SPIN)—American Institute of Physics: OL40-400-106
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Rapra—Pergamon InfoLine Inc.: OL40-300-197
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AMA/NET Socio-Economic Bibliographic Information Base—American Medical Association: OL40-100-113
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Canadian Machine-Readable Cataloguing (CAN/MARC)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-202
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Facts on File—Dialog Information Services, Inc.: OL40-200-145
United States Political Science Documents (USPSD)—NASA Industrial Applications Center, University of Pittsburgh: OL40-400-151
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Pollution Study Data

Air/Water Pollution Report—NewsNet, Inc.: OL40-100-109
Aquatic Sciences and Fisheries Abstracts (ASFA)—QL Systems Limited: OL40-100-119
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Distribution Register of Organic Pollutants in Water (WDROP)—CIS User Support Group Computer Sciences Corp./ATD: OL40-200-111
Ecothek—Questel, Inc.: OL40-200-121
OHM-TADS (Oil and Hazardous Materials—Technical Assistance Data)—CIS User Support Group Computer Sciences Corp./ATD: OL40-300-163
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PA (Pollution Abstracts)—Cambridge Scientific Abstracts: OL40-300-184
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WDROP (Distribution Register of Organic Pollutants in Water)—CIS User Support Group Computer Sciences Corp./ATD: OL40-200-111

Population Study Data

Canadian Census—1981—I.P. Sharp Associates Limited: OL40-100-150
Household Age/Income Forecast—Chase Econometrics: OL40-200-178
National Planning Association United States Demographic Data (NPADEMOG)—I.P. Sharp Associates Limited: OL40-300-147
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POPLINE (Population Information On Line)—Population Information Program-Johns Hopkins University: OL40-300-185
Population Bibliography—Carolina Population Center: OL40-300-185
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Price Indices

Bi/Data Time Series—Business International Corporation: OL40-100-200

Price Indices (Consumer/Producer/Industry)

ASE (Australian Stock Exchange Indices)—I.P. Sharp Associates Limited: OL40-100-126
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AMA/NET Socio-Economic Bibliographic Information Base—American Medical Association: OL40-100-113
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Associations' Publications in Print—R. R. Bowker Company: OL40-100-199
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CBI (Canadian Business Index)—QL Systems Limited: OL40-100-150
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ABLE (Abledata)—National Rehabilitation Information Center: OL40-100-101
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Research and Technology Transfer

Coal Research Projects (COALPRO)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-204
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NTIS Bibliographic Database—Cableshare, Inc.: OL40-300-158
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DIRLine—National Library of Medicine, National Institutes of Health: OL40-200-110

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Canadian Retail Gas Volume (KENTV)—I.P. Sharp Associates Limited: OL40-100-203
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Coal Research Projects (COALPRO)—Canada Institute for Scientific and Technical Information (CISTI): OL40-100-204
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LEDA2—European Space Agency—Information Retrieval Service: OL40-300-107

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Toxicity Related Information

AMA/NET Drug Information Base—American Medical Association: OL40-100-112
CESARS (Chemical Evaluation Search and Retrieval System)—Toxic Chemical Evaluation Section, Michigan Dept. of Natural Resources: OL40-100-204
CESARS (Chemical Evaluation Search and Retrieval System)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-165
Chemical Evaluation Search and Retrieval System (CESARS)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-165
Chemical Evaluation Search and Retrieval System (CESARS)—Toxic Chemical Evaluation Section, Michigan Dept. of Natural Resources: OL40-100-204
Chemical Exposure—Dialog Information Services, Inc.: OL40-100-166
Clinical Toxicology of Commercial Products (CTCP)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-173
CTCP (Clinical Toxicology of Commercial Products)—CIS User Support Group Computer Sciences Corp./ATD: OL40-100-173
EMI (Environmental Mutagen Information)—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-200-137
Environmental Health News—Occupational Health Services, Inc.: OL40-200-136
Environmental Mutagen Information (EMI)—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-200-137
Environmental Teratology Information (ETI)—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-200-137
ETI (Environmental Teratology Information)—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-200-137
Hazardline—Occupational Health Services, Inc.: OL40-200-172
Indexed Collection of the Literature on Aneuploidy—Oak Ridge National Laboratory, Environmental Mutagen, Carcinogen, and Teratogen Info. Dept.: OL40-200-187
OHM-TADS (Oil and Hazardous Materials—Technical Assistance Data)—CIS User Support Group Computer Sciences Corp./ATD: OL40-300-163
Oil and Hazardous Materials—Technical Assistance Data (OHM-TADS)—CIS User Support Group Computer Sciences Corp./ATD: OL40-300-163
Paklegis—Pergamon InfoLine Inc.: OL40-300-173
Plant and Production Data (TSCAPP)—CIS User Support Group, Computer Sciences Corp./ATD: OL40-300-183
Registry of Toxic Effects of Chemical Substances (RTECS)—National Library of Medicine, National Institutes of Health: OL40-300-200
RTECS (Registry of Toxic Effects of Chemical Substances)—National Library of Medicine, National Institutes of Health: OL40-300-200
TDB (Toxicology Data Bank)—National Library of Medicine, National Institutes of Health: OL40-400-143
Toxic Materials News—NewsNet, Inc.: OL40-400-143
Toxicology Data Bank (TDB)—National Library of Medicine, National Institutes of Health: OL40-400-143
Toxicology Information On-line (TOXLINE)—National Library of Medicine, National Institutes of Health: OL40-400-143
TOXLINE (Toxicology Information On-line)—National Library of Medicine, National Institutes of Health: OL40-400-143
TSCA Plant and Production (TSCAPP)—Chemical Information Systems, Inc.: OL40-400-147
TSCAPP (Plant and Production Data)—CIS User Support Group, Computer Sciences Corp./ATD: OL40-300-183
TSCAPP (TSCA Plant and Production)—Chemical Information Systems, Inc.: OL40-400-147

Trademarks

Trademarkscan—Thomson & Thomson: OL40-400-145

Travel Guide Information

Airline Itineraries (AIRSCHED)—Dittler Brothers, Inc.: OL40-100-110
AIRSCHED (Airline Itineraries)—Dittler Brothers, Inc.: OL40-100-110
Firstworld Travel—Firstworld Travel Corp.: OL40-200-156
Mobil Travel Guide—Mobil Oil: OL40-300-136
New York Restaurant Guide & New York Guide—Applebites: OL40-300-150
OAG EE (Official Airline Guide Electronic Edition)—Official Airline Guides, Inc.: OL40-300-163
Official Airline Guide Electronic Edition (OAG EE)—Official Airline Guides, Inc.: OL40-300-163
TravelVision—CompuServe Incorporated: OL40-400-185
Travelwriter Marketletter—NewsNet, Inc.: OL40-400-146

Urban Planning

Acompline—European Space Agency—Information Retrieval Service: OL40-100-103
Banque d'Urbanisme, de planification territoriale et d'environnement—IST-Informatheque Inc.: OL40-100-131
Cecile--Questel, Inc.: OL40-100-161
County Building Permits—Chase Econometrics: OL40-100-190
Land Use Planning Report—NewsNet, Inc.: OL40-300-104
Local Government Information Network (LOGIN)—Control Data Corporation: OL40-300-111

Subject Index

LOGIN (Local Government Information Network)—Control Data Corporation: OL40-300-111
Urbamet—Questel, Inc.: OL40-400-153

Utility Management

Energy Weather Information System—WSI Corporation: OL40-200-133
Utility Compustat II—Standard & Poor's Compustat Services, Inc.: OL40-400-159

Veterinary Care

Controlled-Release Database—Technology Catalysts Inc.: OL40-100-187
VETDOC—SDC Information Services: OL40-400-161

Videotex

Interactive Video Technology (IVT)—Heartland Communications: OL40-200-198
IVT (Interactive Video Technology)—Heartland Communications: OL40-200-198
Video Info (Video Information)—Winslow Associates: OL40-400-162
Video Information (Video Info)—Winslow Associates: OL40-400-162
Video Week—NewsNet, Inc.: OL40-400-162
Videonews—NewsNet, Inc.: OL40-400-162
Videotex Products—NewsNet, Inc.: OL40-400-189
Viewdata/Videotex Report (VVR)—NewsNet, Inc.: OL40-400-162
ViewText—NewsNet, Inc.: OL40-400-163
VVR (Viewdata/Videotex Report)—NewsNet, Inc.: OL40-400-162
Worldwide Videotex Update—NewsNet, Inc.: OL40-400-178

Voice Communications

Telephone Angles—Telephone Angles Newsletter: OL40-400-136

Water

Air/Water Pollution Report—NewsNet, Inc.: OL40-100-109
Canadian Environment (CENV)—Watdoc: OL40-100-152
CENV (Canadian Environment)—Watdoc: OL40-100-152
Distribution Register of Organic Pollutants in Water (WDROP)—CIS User Support Group Computer Sciences Corp./ATD: OL40-200-111
Ecothek—Questel, Inc.: OL40-200-121
ENV (Environnement)—Watdoc: OL40-200-137
Environnement (ENV)—Watdoc: OL40-200-137
National Ground Water Information Center (NGWIC)—National Water Well Association: OL40-300-145
NGWIC (National Ground Water Information Center)—National Water Well Association: OL40-300-145
WATERLIT—SDC Information Services: OL40-400-166
Waternet—Dialog Information Services, Inc.: OL40-400-166
WDROP (Distribution Register of Organic Pollutants in Water)—CIS User Support Group Computer Sciences Corp./ATD: OL40-200-111

Weather

Accu-Weather Graphics/Data System—Accu-Weather, Inc.: OL40-100-102
Agricultural Weather Information System—WSI Corporation: OL40-100-108
Energy Weather Information System—WSI Corporation: OL40-200-133
HEATW (Weekly Temperatures)—I.P. Sharp Associates Limited: OL40-400-168
News/Retrieval Weather Report—Dow Jones News/Retrieval Service: OL40-300-152
Real-Time Weather Information System—WSI Corporation: OL40-300-198
W.A.R.R. (Weatherscan)—Weatherscan International: OL40-400-167
Weather & Energy Analysis Database (WTHR)—Berkeley Solar Group: OL40-400-178
Weather Related Database (ZIPWTHR)—Berkeley Solar Group: OL40-400-180
Weatherscan (W.A.R.R.)—Weatherscan International: OL40-400-167
Weekly Temperatures (HEATW)—I.P. Sharp Associates Limited: OL40-400-168
WTHR (Weather & Energy Analysis Database)—Berkeley Solar Group: OL40-400-178
ZIPWTHR (Weather Related Database)—Berkeley Solar Group: OL40-400-180

Wildlife

Compliance Alert: Federal Register Digest—NewsNet, Inc.: OL40-100-181

Wine

Bacchus—CompuServe Incorporated: OL40-100-127
Bacchus Wine Guide—Bacchus Data Service: OL40-100-128
Electronic Gourmet—Home Management Systems Inc.: OL40-200-126
Fearless Taster—NewsNet, Inc.: OL40-200-147
Wine Library—Source Telecomputing Corporation: OL40-400-174

Women Work Related Information

Catalyst Resources for Women—Catalyst: OL40-100-160

Word Processing

Seybold Report on Office Systems—Seybold Publications Inc.: OL40-400-109

World News

World—Multinational Computer Models, Inc.: OL40-400-174
World Affairs Report—Dialog Information Services, Inc.: OL40-400-175

Zoological Research

Zoological Record Online (ZR Online)—Biosciences Information Service: OL40-400-180
ZR Online (Zoological Record Online)—Biosciences Information Service: OL40-400-180

An Overview of On-Line Databases

In this report:

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Full Text versus Bibliographic: A Brief Comparison .... -106

This report will help you to:

- Understand how and why on-line databases are created.
- Learn the differences among various types of databases.
- Decide when going on-line makes sense and when it does not.

Sometimes, particularly if you're new to the online communications field, electronic information doesn't seem quite real. You start your computer, load a communications program, and dial the phone. Then you tap a few keys, and like magic the latest stock quotes, statistics from the Consumer Price Index, or the full text of every article Peter Drucker ever wrote for the *Harvard Business Review* begins scrolling up your screen.

Where does it come from? Apparently out of the ether itself. For all one can tell, hitting the keys of a communicating computer could be the moral equivalent of spinning a Tibetan prayer wheel, each revolution of which transmits a copy of the paper prayer within to the gods. The difference is that the gods' response to the supplications of the modern personal computer are decidedly more manifest. And a lot quicker. Such is progress.

Arthur C. Clarke has observed that a sufficiently advanced technology is indistinguishable from magic. In reality, however, the system that delivers a complete summary of your major competitor's June advertising outlays to your screen isn't advanced at all. It's just different from what you may have experienced so far. Like all systems, it can be understood, mastered, and manipulated to suit your ends.

The Links of the Chain

Whenever you want to tap into a database, the first step is to establish a communications chain linking you to the database's mainframe computers. The process starts when you load a communications program into your computer and plug the machine into

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a modem. For its part, the modem plugs into the telephone line. Its job is to translate your computer's electrical impulses into sound so they can be sent over those lines and to translate sounds coming in from a remote computer into electrical impulses so they can be used by your machine.

The next step is to dial a local number that will connect you with Tymnet, Telenet, or some other packet switching network serving the database you wish to access. Once the connection is made, whatever you key in at your PC will be received by the large mainframe or minicomputers that house the database. Software running on those distant computers will interpret your commands and act accordingly.

Specific details will vary, but generally you can think of the computer center of a large database or online service as a huge air-conditioned room with a false floor hiding a rat's nest of cables and a ceiling concealing a grid of pipes capable of flooding the room with fire-asphyxiating gas in seconds at the first hint of flame.

The computers, large refrigerator-sized beasts, are over in the corner next to the rack systems that hold the modems and telephone multiplexors. The modems silently blink as calls come in or disconnect. The computers, each of which is called a "system," are also silent except for the constant hum of their cooling fans.

The real action is taking place in the center of the room, an area filled with row upon row of identical metal boxes. Each box is about the size and height of a top-loading washing machine, and there may be literally hundreds of them lined up cheek-by-jowl. Together they form the heart of the database, for each contains a disk pack holding millions of pieces of information.

In the microworld we would refer to these boxes as "hard disk drives." They are the direct descendants of the so-called "Winchester" drives introduced by IBM in 1973, though today they are usually referred to as DASD ("daz-dee") for Direct Access Storage Device(s). However, to cut down on this report's CAQ (Confusing Acronym Quotient), we'll continue to call them disk packs.

A disk pack consists of a stack of large metal platters coated with magnetic film. An inch or less of space separates each platter in the pack from the one beneath it and the one above it. The whole arrangement occupies about as much space as a large layer cake, but it can hold up to two and a half billion letters or "characters." Since one "byte" is required to store one character, the capacity of these disk packs can be expressed as 2.5 "gigabytes." When mounted in a disk drive, the platters spin at speeds in excess of 60 revolutions per second.

Each disk drive in the computer center has an address number, of course, and once you've decided on the information you want, the database software can easily locate the disk pack with the platter containing it. The software also knows exactly where on the platter the information can be found. Thus, when you enter a command at your computer telling the remote system to display an article from *Time* magazine, the database mainframe orders the appropriate disk machine into action.

A device in the disk drive that can be likened to a large comb on a mechanical arm moves out from where it's been hiding in one corner of the machine. On the tip of each "tooth" of the comb is a read/write head similar in function to those found in a tape recorder. The teeth of the comb intersect the spinning disk pack in the spaces between the platters. Approximately 16 one-thousandths of a second after the drive receives its marching orders from the mainframe, the correct magnetic track on the correct platter is located and the appropriate read/write head, floating on a film of air directly above the disk surface, begins shoveling up the data.

The *Time* magazine article, long since reduced to digital form, consists of nothing but a pattern of tens of thousands of magnetic marks on the disk symbolizing either an "on" or an "off" pulse. Using those marks as its guide, the read/write head duplicates that pattern as a series of high- and low-voltage pulses at rates as fast as three megabytes (three million bytes or characters) a second. It pumps those pulses to the database's main computer, which in turn sends them to a modem for conversion into sound.

The sound waves leave the computer center, enter the telephone system, and soon arrive at your modem. Your modem converts them back into electrical pulses and feeds them to your computer, where a microchip turns them into human-readable characters and displays them on your screen. At that point, you can either send the characters to your printer or record them on a disk. Or you can just let them scroll off into space.

From Periodical to Platter to Printout

The electronic delivery system we've just described is the centerpiece of the online information industry. The industry has been developing since 1972. That was the year the first passwords were issued for the RECON system that the Lockheed Missiles and Space Company had developed for NASA in 1968. RECON stands for "Remote Console Information Retrieval System," and the remote terminals it employed represented a major advance. Prior to that time, if you wanted to get information into or out of a mainframe computer you had to be on-site at the computer center with access to the machine's main console, card readers, magnetic tape drives, and drives capable of reading punched paper or Mylar tape. Still in use today, RECON is the predecessor of the commercial system operated by Lockheed's DIALOG Information Services, Inc.

There is nothing that is information industry-specific in what we've discussed so far. The same communications links, computer hardware, and disk packs are used in many industries. What is unique about the information is the kind of information that is stored on those disk packs, how it is formatted, and the capabilities of the software running on the mainframe systems.

If you're going to use these systems effectively and feel comfortable doing so, it is essential to know a thing or two about them. The best way to do that is to consider the process by which information becomes available online in the first place. That's what we'll do next, as we peer over the shoulder of someone considering the creation of a new database.

Present at the Creation: The Story of ADAM

The process starts with the desire of some man, woman, or company to make a particular body of information available for electronic searching and delivery. Why? To make a buck, of course. Hopefully lots of bucks, since ours is an information economy, and people will pay good money for good information.

Databases can best be thought of as products, and as with magazines, books, or manufactured goods, most are created because someone perceives an unfilled gap in the market. On the surface, at least, the raw economics of it look very good. Once printed information has been digitized into a pattern of bits and stored on a platter, what could be more profitable than selling that same pattern in the form of electronic impulses over and over again? No ink. No paper. No postage.

Let's assume the prospective database creator in this case is a fellow who has worked for several years in advertising and marketing. He knows from personal experience how crucial it is to have the right information at the right time in those fields. What is needed, he feels, is a master database of marketing information that would let a user instantly obtain the latest information on new product announcements, plans for new ad campaigns, current market share and demographic information, analyses, informed opinion, and everything else he has wished he had instant access to during his career—a database, in short, that would have all the answers for someone in the marketing or advertising professions.

He even has a name for the product. Following the practice of many existing databases, he has chosen a "friendly" acronym. He has decided to use the name ADAM for "Advertising, Demographics, and Marketing." When it finally becomes available, ADAM will join ERIC (Educational Resources Information Center), PETE (Peterson's College Database), MARC (Machine Readable Cataloging), LISA (Library and Information Science Abstracts), and the rest of the kids online.

Content and Coverage

The next thing our friend must decide is exactly what ADAM will contain. This is without a doubt the most crucial step, since the decisions made here influence absolutely everything else from the initial and ongoing costs of creating and maintaining ADAM to its competitive position in the information marketplace. This step is also the most difficult, since there are no rules. ADAM can cover anything its creator chooses, from magazine articles and press releases to doctoral dissertations and train schedules.

Other database creators have had things a lot easier, since many of their products are essentially online versions of single publications. The *Harvard Business Review* database, the *New York Times* database, and many of the directories of people, companies, and organizations are all good examples.

Single-source databases like these are also easier to market to potential users. Because lots of people are familiar with the source publications, no one has to spend a great deal of time explaining or figuring out what the database covers. This is obviously not the case with our mythical ADAM database or with such very real products as Magazine Index, PTS PROMT, or ABI/INFORM, each of which covers hundreds of diverse magazines. Consequently, one of the first things you should ask when approaching a database for the first time is: Where does the information come from?

To keep our example simple, we'll assume that our database creator has decided that ADAM should cover all of the major advertising and marketing journals (*Advertising Age*, *Sales and Marketing Management*, etc.), plus the leading trade magazines for every major industry. He might include *Variety* and *Billboard* for the entertainment industry, for example, as well as such publications as *Progressive Grocer*, *Nation's Restaurant News*, *Publishers Weekly*, and *Computer Retailer*. He might also include selective coverage of *Business Week*, *Time*, *Newsweek*, and *U.S. News and World Report*. Or he might not. Again, there are no rules.

When Should Coverage Begin?

We will assume that ADAM will cover a total of 300 publications. The next question is: How far back should the coverage go? Should it start at the current year or go back to 1980, for example? Should coverage of each magazine begin in the same year or would it be all right to go back, say, three years for some but only one year for others?

There are no easy answers here either, and we won't belabor the point. The important thing is to be aware that due to competition, the costs of database preparation, maintenance, and storage, and many other factors, different database producers have chosen to begin their coverage with different years. As noted elsewhere, it is usually not enough to know that a given database covers, say, *Business Week*. Often it is important to ask: When does the coverage begin?

The Question of Format

The next major point to be decided is the form the online information should take. Suppose you were to search ADAM for references to ice cream. You would enter a command like FIND ICE CREAM. The computer would conduct its search and tell you how many references to "ice cream" are in the database. In online argot, each reference is called a "hit." If you wanted to look at your hits, you would next enter a command like DISPLAY.

Let's suppose that you got five hits on "ice cream." You enter a command to look at the first reference. What do you suppose would then be displayed on your screen? Your instinctive answer would probably be "Why, the complete article, of course." You might be right. But more than likely, you would see something else.

The nature of the source material is ultimately the determining factor, but in general there are three main types of database formats: bibliographic, full text, and statistical. As you can see from Table 1, statistical databases are essentially collections of numbers like stock quotes, demographic tables, production and consumption statistics, and so on. This is clearly not a relevant format for ADAM.

The Consumer Price Index (CPI) maintained by the U.S. Bureau of Labor Statistics is probably the quintessential statistical database. With the exception of the few words of text used to label the contents of a table, it contains virtually nothing but numbers. For example, Table 1 shows the CPI, by

Table 1. Statistical Databases: Nothing but Numbers

CONSUMER PRICE INDEX FOR ALL URBAN CONSUMERS SUBFILE

ALL ITEMS;
U.S. CITY AVERAGE;
UNADJUSTED DATA

INDEX (1967 = 100)

Years	Q1	Q2	Q3	Q4
1983	293.0	296.6	NA	NA
1982	283.0	287.3	292.8	293.4
1981	262.9	269.0	276.7	280.7
1980	236.5	245.0	249.6	256.2
1979	207.0	214.1	221.1	227.6

NA—Not applicable.

Source: U.S. Bureau of Labor Statistics Dialog File 175;
Dates Available: 1966-June 1983.

quarter (Q1, Q2, etc.) for the years 1979 through 1983 just as you would see it on your screen:

Searching for and downloading this information from DIALOG took less than a minute and cost under $2.00. Extending the list backward to include years before 1979 would have cost a few cents more.

File, Record, and Field

As with all databases that cover magazines, newspapers, journals, and similar publications, ADAM will be either a bibliographic or a full-text database. However, before we can explore these alternatives, we must pause for a moment to get righteous about our terminology.

Online databases, like those you might create yourself with PFS:File, dBASE III, or some other personal computer database management package, are called "files." Each complete item in the file is called a "record." And each piece of information in the record is called a "field."

> *Online Tip:* Occasionally you may hear the term "unit record" as well, but this is a rapidly fading holdover from the days of the punched 80-column cards one was admonished never to fold, spindle, or mutilate. At that time, each punched card typically contained a single record, and the term "unit record" was used to refer to both the information and the card itself. Similarly, fields are sometimes called "data elements," a term that is also gradually fading from use.

The easiest way to keep these terms straight is to remember the classic example of a collection of canceled personal checks. All the checks together constitute the file. Each individual check is a record. Each piece of information on a check (the date, the payee, the numerical amount, etc.) is a field.

In Table 2, for example, all of the download text constitutes a single record in the mythical database file we've called ADAM. The fields include the article title, the name of the journal, the publication date, the volume number, the issue number, and the page numbers. The summary paragraph is also considered a field, as is the complete collection of "keywords" at the end of the record.

Here is a complete record from our mythical ADAM database. Notice that the record has three main sections: the bibliographic citation, the abstract summarizing the original article, and the keyword list.

Table 2. A Complete Record from ADAM

Here is a complete record from our mythical ADAM database. Notice that the record has three main sections: the bibliographic citation, the abstract summarizing the original article, and the keyword list.

Upscale Ice Creams Melt the Competition
Nation's Restaurant News
June 16, 1986 v. 20 no. 25 p. 1,4

According to the Washington, DC-based International Association of Ice Cream Manufacturers, "superpremium" ice cream is the fastest-growing segment of the frozen dessert market. While overall frozen dessert sales have increased only 2% per year, superpremium sales (ice cream with more butterfat and less air than traditional products) have been growing at 10% to 15% a year. Most leaders in retail grocery sales have already opened "dip stores," a move that has prompted traditional chains like Baskin-Robbins to add "gourmet" flavors. The article includes an overview of some of the major superpremium manufacturers (Haagen-Dazs, Ben & Jerry's, and others).

KEYWORDS: food—desserts, dairy products, market information, shelf space, trade associations, fast food, yuppies, health concerns—cholesterol.

The Bibliographic Format

The records in a bibliographic database contain at least two components: a "bibliographic citation" or "bibcite" and a list of keywords. The bibcite format will be familiar to anyone who has ever used a library card catalog or prepared a bibliography for a term paper. It includes the article title, the author's name, and all relevant facts about the source publication.

In Table 2, the bibcite occupies just the first three lines of the download text. As you can see, it includes everything you need to know to quickly locate the original article in a library or order a copy from a "document delivery" service of the sort described. But it doesn't contain any real information.

Nor does it contain enough information to make it practical to search for this record. Remember, computers are nothing if not literal-minded. If a word does not exist in a record there is no way the machine can find it, and the bibcite alone doesn't give you much to work with. For this reason, the creators of bibliographic databases almost always add a field of keywords. These words may also be called "indexing terms" or "descriptors."

If ADAM is to be a bibliographic database, its creator would probably hire a staff of professional indexer/abstracters to prepare the material. These folks would read each source article and decide which keywords best describe its contents, the issues, topics, or concepts it covers, and where it fits in the overall scheme of things. The keywords the indexer/abstracter decides upon may or may not appear in the source article. It isn't likely, for example, that keywords like "dairy products," "trade associations," or "fast food" would appear in the article cited in Table 2. But as you can infer from the summary paragraph, each of these concepts is relevant and likely to be of interest to ADAM users.

Controlled Vocabularies

How does the indexer/abstracter know which words to choose? Why is it "dairy products" and not "dairy industry," for example? The answer is that indexing terms are almost always drawn from a predefined list of words called a "controlled vocabulary." The complete controlled vocabulary used to index a database is called a "thesaurus."

For example, John Wiley & Sons, producer of the Harvard Business Review Online (HBRO) database, has established a list of 3,500 "authorized index terms" that includes everything from "ordnance" to "x-ray apparatus." The words "ammunition" and "x-ray machine," in contrast, are not on the list and are thus not used as keyword descriptors. The only way to determine this fact is to look up "ammunition" in the HBRO thesaurus, where you will be told, "See ordnance." Needless to say, if you plan to do much searching of a database that uses a controlled vocabulary, it's essential to have a copy of its thesaurus. Wiley sells the 400-page HBRO thesaurus for $50.

Including Abstracts—The Other Bibliographic Option

A record consisting of a straight bibliographic citation and a list of key index words can be quite serviceable. Indeed, when the information industry was starting and computer storage costs were high, it usually wasn't economic to offer anything but bibcites and keywords. Then too, communications speeds were four to six times slower than they are now, making it impractical to transmit significant quantities of text. There were few complaints from end-users, however, since most were librarians with easy access to the source material and since online databases represented such a leap forward.

Some commercial databases, like Information Access Company's (IAC) Magazine Index, still offer nothing but bibcites and keywords. But it is much more typical these days for the producer to include short summaries of the source article as well. These are called "abstracts," and as you might expect, they are typically prepared by the same professionals responsible for indexing a database.

In Table 2 the abstract is the paragraph of text between the bibcite and the keywords, and as you can see, it gives you a much better idea of whether it would be worthwhile to obtain a copy of the source article. Indeed, a good abstract may very well contain exactly the fact, figure, or statistic you're looking for and thus eliminate the need for the source article entirely.

As noted, the abstract itself is considered a field in the record, and it is almost always searchable. That means that you would get a hit on the record shown in Table 2 if you searched on "superpremium", "fastest growing segment", "butterfat", "dip stores", "gourmet", or any other word or phrase in the abstract. The industry usually refers to both bibcite-only and bibcite-cum-abstract products as "bibliographic databases."

The Full-Text Format

Finally, there is the full-text format. Technically, any database that contains a complete copy of some kind of source material can be called "full text." Thus, since the Marquis Who's Who database is an online copy of its source volumes, it is a full-text database. Usually, however, the term is applied only to databases that offer complete magazine, newspaper, or other articles online. For example, IAC's Magazine ASAP database contains the full text of over 100 publications dating back to 1983.

Full-text records typically contain bibcites and keyword fields as well as a verbatim copy of the source article. The only source material you won't find are graphics, charts, photographs, and other forms of illustration that at this writing cannot be effectively transmitted online. However, most full-text records will inform you if the source article includes this kind of material.

Full Text versus Bibliographic: A Brief Comparison

The Sex Appeal of Full Text

No one creating a database today can afford to ignore the full-text alternative. For one thing, it is what new users and others not steeped in the ways of the information industry expect to find when going online. It is instantly gratifying and undeniably convenient. And from a marketing standpoint, it's the sexy, "in" thing to offer right now. But it may not be the best information alternative, either for users or for database producers.

Storage costs have fallen. But disk packs aren't free, and space still rents by the megabyte. At this writing, ADAM's producer could expect to pay anywhere from $1.25 to $10 or more per month per megabyte, depending on whether he owned the equipment himself or rented space on someone else's system. As a yardstick, the editorial matter in a daily newspaper can require anywhere from 500 to 300 megabytes of storage a year. Those costs not only continue but continue to grow as more information is added to the database.

If ADAM is to be a full-text database, its creator will also have to pay copyright royalties to the publishers of the original material. But that expense is minor compared to the costs of converting printed matter to magnetic form. This can be done in a number of ways. Unfortunately, none of them is as easy as one might think.

Great advances have been made in optical scanners in recent years, and more and more databases are being created directly from the computer tapes used to drive typesetting equipment. But at this writing, most data is still keyed in by hand.

Keying It Twice

Saztec Corporation of Rolling Hills Estates, California is one of the leading firms in the data entry industry. In addition to facilities in Kansas City and Dayton, the company has offshore operations in Singapore, Scotland, and the Philippines. Among other things, it is responsible for keying in many of the 140 periodicals offered by Magazine ASAP.

The process is labor-intensive. According to Tom Reed, the firm's president, "Everything is keyed in twice for accuracy. After the initial operator is finished entering the text, a verification operator loads some special software and rekeys everything from the original text. This is called 'over-keying' the document."

Most companies in the industry do some form of over-keying, though their techniques may vary. Typically, although the verification operator's screen appears normal, the software keeps a copy of the file created by first operator in memory. When there is a discrepancy between what's in memory and what was just entered from the keyboard, the computer stops and notifies the operator. The operator then investigates and makes the necessary correction.

Online Tip: Saztec Corporation also does a lot of work for Mead Data Central and Business Research, producers of the Investext database. It can convert most typesetting tape into a format required by the database vendors, and it is exploring the use of optical scanners. "If the scanners on the market today could do even half of what their manufacturers claim they can do, we'd use them," Tom Reed says. "Essentially we and every other successful company in this business have to offer a full range of services, since any given database may include material from a wide variety of sources." For more information contact:

Saztec Corporation
27520 Hawthorne Blvd., Suite 170
Rolling Hills Estates, CA 90274
(213) 544-0337

At this writing it is doubtful that even 30 percent of available databases are full-text products. But consumer demand, the continuing drop in storage costs, and the increasing use of computerized typesetting in the publishing industry all point to a large increase in that percentage. The text may be on a CD-ROM disk (Compact Disk-Read Only Memory, the term for laser-read video disks) instead of online. But one way or another it will be available.

That's all to the good, of course. Magazine ASAP, for example, can instantly provide you with the full text of tens of thousands of articles at a cost of $7 each (plus connect time and telecommunications network charges). No delays. No trips to the company or public library. No need to send away for the article. Just the information you want when you want it. What businessperson wouldn't pay $7 to have an important article in its entirety delivered instantly to his or her screen?

Bibcites and Abstracts: A Better Alternative

As a new online searcher it is tempting to believe that because it is more "complete," a full-text database is ipso facto better than one offering bibcites and abstracts. But that is definitely not the case. In fact, much of the time exactly the opposite is true.

A database of abstracts is usually much easier to search. Unless you are looking for a very specific and unique combination of words, searching a full-text database can be treacherous. With so many words, the potential for unexpected (and thus irrelevant) combinations and occurrences of your search terms is enormous. You can easily end up retrieving and paying for articles that have nothing to do with your subject of interest.

Abstracts can also save you both time and money. For example, if you wanted information on the annual sales growth of superpremium ice cream, which would you rather read, a complete 1,000-word article or a short, fact-packed abstract of the article like the one shown in Table 2? Which would you rather pay, as much as $7 for the full text or about 60¢ for the bibcite and abstract?

Online Tip: Of course, a poorly prepared abstract is no good at all, and it is important to be aware that even the best abstracts are necessarily subjective. Most are created by trained professionals, but each individual may interpret the same source article differently. Many databases cover the same publications, but each may emphasize different aspects of a given article. Thus an abstracter working for Database A may choose to highlight points that an abstracter covering the same article for Database B may choose to ignore, and vice versa.

You can make this work to your advantage. Since each abstract is likely to tell you something unique about the source document, it is often very helpful to look at two or more abstracts of the same article.

On Becoming an Information Provider

Finally, our friend must decide how ADAM and the information it contains will be sold. He could do it himself. But even if he managed to get together the $30,000 to $50,000 needed to buy the hardware required for a small system, he might not want to be bothered with details like billing, credit checking, and customer service. His best bet would probably be to try to persuade DIALOG, BRS, Dow Jones, or some other database vendor to handle these details for him.

That would make our friend what the industry calls an "information provider" or "IP" ("eye-pea"). In many respects, IPs are to the database vendors as authors are to publishers. The one supplies the information and the other handles the marketing. Vendors charge users by minute of connect time and pay a royalty to the IP based on the number of minutes someone spends accessing his or her database. Royalties are negotiable, of course, and the differences among royalty rates is one of the reasons why a database vendor like DIALOG may charge you $15 an hour to use one database and $75 an hour to use another.

According to LINK Resources, Inc., a New York-based consulting firm, in 1985 IP royalty rates were typically around 20 percent, though as the supermarket services compete for the most desirable databases that figure could rise to 28 percent or more in years to come. As with any other product, it may or may not be in an IP's best interests to negotiate an exclusive distribution deal with one of the vendors. ■

Assessing the Cost-Effectiveness of On-line Databases

WHEN TO USE DATABASES

In the past, the decision whether or not to resort to databases was a simpler one. There were few bases, and their contents were often at least as dated as their equivalent hard-copy indices. In addition, most of the databases typically only led you to citations to articles without providing any text. Today, databases are generally current. They allow access to information which is not indexed elsewhere, and in some cases which has not even been published. They permit virtually up-to-the-minute access to some news sources, such as the *Wall Street Journal*, and they let you have access to the full text of increasing numbers of references. As a result, databases can and should be among the first resorts for research in virtually every area of interest to a business.

As an illustration of the cost-effectiveness of database use, the authors prepared a report in 1984 for a naval research facility on the use of commercial databases. This report showed how businesses use databases and apply basic Competitive Intelligence (CI) techniques to commercial databases to provide an answer to an economic question. It also showed the databases which were considered and applied CI techniques to developing an answer to a question about Japan's dependence on oil imports. The report compared the cost-effectiveness of using on-line techniques with more traditional techniques, finding that the costs of on-line techniques were from 24 percent to 57 percent less than traditional research methods. In addition, the report concluded that more traditional techniques would produce the required data less quickly and would probably yield less satisfactory data.

HOW TO USE DATABASES EFFICIENTLY

The more that you use databases, the more efficient you will become. If you use databases regularly, you become familiar with their peculiar protocols and quirks. Knowing that, you can more effectively narrow the focus of your research, which can keep overall costs down. Conversely, the less you use databases, the more it will cost you each time you get on-line.

One way to increase your direct experience is to practice. A number of database vendors have ways in which the novice can acquire search skills without substantial expenditures. Some have created practice bases, which you can use at rates substantially below the average database rates. These are typically closed versions of often-used bases. That means they contain a number of citations and abstracts from the past. However, new ones are not added to it. In other cases, database producers, in connection with database vendors, will give users free or discounted time during one month to be used on a particular database. This is to encourage those not familiar with the database to try it out. The object is to convince the users that this database should be used more frequently than they have used it in the past. These can be good opportunities for you to learn how to use particular bases or to sharpen your skills in using them. But they do no good if not used.

Some vendors print articles displaying specific search strategies and the results they actually produced. This is not as useful as doing it yourself, but it can be very helpful in feeling comfortable with particular databases. Other database vendors or database creators run seminars designed to train people to use specific databases. Some of these seminars are free; others are not. In many cases, the sponsors will generally have free time for attendees to try out their skills directly on the selected databases, or they will give those attending free time on the database after the session.

Search Design and Execution

When designing a computer search, you must keep in mind what output you want and in what form, in order to control costs. This is particularly critical if you will not be executing the search yourself but will be having someone else do it for you for your use in research and analysis. There can be important differences in cost and trade-offs in time, depending on what you need and what you ask for.

- Do you want a printed copy of the results or is it sufficient to have the results temporarily stored on a computer disk? If you want printed copy, it may be cost-effective to have the results printed at the data vendor's headquarters, or off-line, and then sent to you. You save the cost of on-line time involved in displaying the results on the screen. Printing the results as they are displayed is the most costly option, since you must stay on-line until your printer, the slowest link in the chain, has finished. Having the results printed off-line is the least expensive, but you may have to wait up to a week for the results. Also, you cannot edit the results as easily as you can if you have down-loaded the search onto a disk which can later be edited with a word processor package.

- What kind of data do you want? Do you merely want to know how much data there is on a subject? If so, all you need is a count of the number of hits. Do you want to know the type of data available, so you can select those references of greatest interest? Here you may be satisfied with titles and indexing concepts only. Is the age of the data important? If so, the publication date should be

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This Datapro report is based on Carolyn M. Vella and John J. McGonagle, Jr., "Cost Effectiveness of Data Bases," in *Competitive Intelligence in the Computer Age* (Quorum Books, a division of Greenwood Press, Inc., Westport, CT, 1987), pp. 147-159. Copyright © 1987 by Carolyn M. Vella and John J. McGonagle, Jr. Reprinted with permission of the authors and publishers.

included. Does it make a difference where the data comes from? If so, get the source, and perhaps the author, printed. Do you need quick information or a good sense of what the article may contain? Here, get the abstract, but eliminate the indexing terms. Do you want the entire document? Then order the full text to be printed, off-line if you have the time. In general, ask for as little as you need. The key here is to ask for as little as possible, because each additional item you have printed for each hit costs more. You can always go back for more, but if you have too much printed now, you cannot save the money you have wasted.

- Keep the search request as narrow as possible, whether you are doing it or ordering it to be done. In most cases, if you make your initial search request too broad, even if it is narrowed as you proceed, you will be costing yourself time and money.

- Make sure you know what you are asking for and that using a database is the best way to do it, given the constraints of time, personnel, and money. For example, several years ago the chief librarian of Time, Inc., reported on that corporation's experience using one database. He compared the average cost of a search in his section, which then did over 200 searches each month, with those in another section of the corporation. The other section's average research costs were 413 percent of his unit's. The higher costs were attributed to a combination of inefficient searching and using the database when the information could have been retrieved elsewhere more easily.

Overlapping Databases

You will find, in an increasing number of cases, database vendors providing access to companion or related files. Companion files are databases which overlap for one or more of the following reasons:

- One of the bases purposefully includes a complete or partial subset of the other. An example of this would be HEALTH PLANNING & ADMINISTRATION, which contains references from MEDLINE as well as from other sources. This means it duplicates some references also found in MEDLINE.

- One of the bases covers the same publication or publications, but is more current than the other. For example, NEWSEARCH indexes a number of publications, including the *Wall Street Journal.* It is updated frequently, approximately every month. However, Dow Jones makes available a database containing only the *Wall Street Journal*, with access to issues available at 6 AM each business day. On the other hand, one vendor offers INVESTEXT reports from the last six months only. Another offers all reports indexed by the database provider since the base was created.

- One of the bases covers the publication, along with many others, on an abstracted basis, while the other provides full-text access. An example here is ABI/INFORM, which indexes, among hundreds of other publications, *Business Week*, and provides an abstract of the article indexed. *Business Week* is also available, in full text, in McGRAW-HILL PUBLICATIONS ONLINE.

When companion files are prepared by the same database producer, often you can arrange your search to eliminate duplicate records by a carefully chosen search command. For example, if you are searching HEALTH PLANNING AND ADMINISTRATION on-line with one vendor, BRS, you can eliminate duplications with MEDLINE by requiring that all articles cited have a particular code letter. That will produce citations which are only in HEALTH PLANNING but not in MEDLINE. From there, you would continue the search in MEDLINE and then combine the results.

If companion files are not prepared by the same database producer, you should make sure you understand the contents and coverage of each base before using either one. For example, if you have used McGRAW-HILL PUBLICATIONS ONLINE, and have isolated some items, identify both the publications from which they came and the dates of the publications within that base. Then, when you begin your search on ABI/INFORM, you would order that the search results exclude citations for those publications, but only for the dates covered in the McGRAW-HILL PUBLICATIONS ONLINE database.

If you do not eliminate duplicate records from the search strategy, you will be paying for the computer to search through records unnecessarily. If you do not eliminate duplicate records from the results which you have displayed on the computer or printed out, not only will you be paying for the additional computer time needed to display them on the screen or to print them out, but you will also be paying duplicate fees for each unneeded citation, abstract, or article. These fees alone could range from fifteen cents per title to nine dollars per article, plus the associated additional computer time. In addition, there are few things more frustrating in reviewing search results than seeing the same item cited more than once. That means you have spent money needlessly.

DOING IT YOURSELF

If you will do any database searching yourself, you should first decide what databases you want to use and then check into the costs of using them. The subject of fees is covered later in this tutorial.

Assessing the Cost-Effectiveness of On-line Databases

Hardware, Software, and Training

Having selected a database or database vendor, you will need the following:

- A contract with the vendor, allowing you to access the databases. The vendor will, in turn, provide a password which should be guarded most carefully.

- A basic manual, available from the database vendor, on using its databases. In some cases, this is free. In others, you must pay for it. It is a wise investment.

- A personal computer.

- A modem. This is a device for making telephonic communication with other computers.

- A telephone line which the computer can use for contacting databases. You should avoid having a call-waiting feature, or any feature which allows someone to break into the line. If someone breaks into the line or there is a signal on the line while you are using it, such as that generated by a call-waiting signal, you will probably lose contact with the mainframe computer. This is because some computers interpret the interruption as a signal to drop you from the system. If you have an extension telephone on the line, it should not be used, or even picked up, while you are in communication with the mainframe.

- A communications package. This is software which allows you to talk with the mainframe computer.

In addition, you should consider having the following:

- A printer.

- A word processing program, so you can edit the results of your research and integrate them with other items.

- Special search aids for the databases most frequently used. In addition to those which can be purchased, from time to time, database suppliers produce free search aids, such as helpful hints, lists of search codes, etc., which you should get and keep.

- Time and funds to attend a specialized class on using the databases you most often resort to. Key considerations in training are discussed later in this tutorial.

In addition, some experts suggest that you have a second telephone line by the computer. The rationale is that, if you are having difficulties, you can call the database vendor or even the database supplier while you are still on-line and get immediate assistance. Talking to someone while you are on-line may be a quick way to get help and might avoid the loss of valuable time spent struggling to find a solution to a problem. This is also true if you need help signing on. You can talk with someone and try out their suggestions while they listen. Of course, if that is the problem, all you are paying for is telephone time, not database time.

While an additional telephone may be beneficial in some cases, it does have serious drawbacks, some of which are listed below:

- If there is a second telephone there, others can call you. If you insist upon answering a ringing telephone, don't forget that you are also on-line with a database at a rate ranging from fifty cents to six dollars per minute. If you must have another telephone at your computer station, it is recommended that you get one that has a feature permitting the ring to be completely turned off.

- If you plan to call for help, you will have to have the numbers handy. Otherwise, just looking them up could cost you five dollars.

- If you are having real trouble, you should sign off, or even break the connection, to get off and avoid running up unnecessary costs. Make sure that you save your entire work to that point, whether it is printed out or on a disk. With it in front of you after you have signed off the database, you can go over your problems without being connected to the database and running up large costs. Also, if needed, you can send a copy of the work showing the problem to the database vendor or database creator to get help or even a credit, if the problem is their fault.

Fees and Pricing

Arranging for access to databases may involve initial sign-up fees and/or minimum monthly charges. While competition has resulted in a number of vendors waiving sign-up charges or establishing low initial charges, some specialized vendors still require substantial onetime payments. Others require you to pay a large minimum each month, whether or not you use the database. Some of these require the minimum charges in addition to actual usage; for others, you pay for a minimum amount of time whether or not it is used. Another pricing option, tiered pricing, is becoming more common. Under this system, the rate you pay for a database can vary. If you pay no minimum charge per month, or do not guarantee a minimum usage, your rate per hour for the database may be 50 percent or more above the rate available to a user who has a minimum monthly usage or pays a minimum monthly charge.

If you elect to access databases directly, study the pricing plans before you sign up with a vendor. You may find that you need access only to a limited number of databases. If so, check to see which vendor has the best pricing structure for your expected use. Once you have agreed to use a vendor, check your bills regularly to see if you should elect a different pricing structure.

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Assessing the Cost-Effectiveness of On-line Databases

Training

As previously mentioned, some database vendors will provide free training or free time to practice on the base. But you may find that the only training available involves a fee, in some cases a substantial one. Before you decide whether or not to purchase such training, consider the following:

- Is the training limited to one or a selection of databases? If so, are they the ones you are most likely to use?
- Will you be able to access the database during the class with an instructor at hand to help? Do you pay extra for this?
- Will you have any free time on the database after the class?
- Will you receive any training aids to take back with you?
- In determining the actual costs of such training, have you included transportation to and from the training site, as well as other associated costs, such as meals, lodging, calls back to the office?
- What are the hidden costs involved in taking the course? Will you have to arrange for someone else to do your work or will it have to be postponed while you take the course? Will the course cost you or your firm money because you cannot bring in new clients, do billable work, or make sales while at the course?

Software Aids

There are increasing numbers of ways to access databases through menu-driven software. These are programs which guide you through signing on and executing a search by asking you questions. Depending on your answers, the program will select a set of databases to search and will then execute your search for you. Some of these programs are built-in options available when you sign on to a database. Others are packages purchased specifically for your computer. For the occasional user seeking general background information on a broad topic, they can be cost-effective. That is because they avoid the time and costs of learning about technical protocols and the design of search statements. However, when the user is seeking to locate specific information from among a veritable forest of databases and citations, menu-driven software may have disadvantages. First, you may be paying for connect time to the database while the program translates your commands into the form required by the database. Second, you may lose the ability to refine your search statement and strategy by searching items other than titles and abstracts, typically what the menu-driven software keys on. Third, in some cases you have surrendered the ability to select the specific database(s) on which to conduct your search. Fourth, to make substantial modifications to the search, you may have to stop it and start over. Fifth, even the creators of these aids will admit that they are not intended for expert searchers who are used to using synonyms, term truncation, and so on, since they are limited in the number of terms which they can take and, compared with conventional searches, may produce results which are not as relevant.

Now there are also menu-driven systems in databases, allowing you to answer questions and then run a search. They have the same benefits and disadvantages as menu-driven software. The choice between menu-driven and regular systems may be compared to the decision on who you should hire to do work in a home. You can hire a handyman or a carpenter. In some situations, you need the fine touch of the carpenter; in others, you need the solid strength and common sense of the handyman. Overqualification can be just as costly and inefficient as underqualification.

Keep Track of Time and Charges

When running a search, arrange for a display of the elapsed time you have spent on-line to be available at all times. On some computers, you can arrange for this to be displayed on the screen while you are running the search. If that is not possible, get an electronic stopwatch or something similar, which shows total elapsed time, and place it by your computer station. When you start to sign on, start the clock. Check it frequently.

Once you have mastered search techniques, establish a target time frame for your search. Using the rates for on-line time and communications charges, you can estimate a gross cost for the computer time involved in the search. Of course, this will not include charges for abstracts and other displays.

With many databases, you can arrange for time or charges to be calculated as you progress. In some, you even have the ability to ask for the current amount of money or time involved without having to stop the search. In others, you must sign off the database you are using to see this. Always be sensitive to the time and charges involved. They can mount up quickly.

If you are dropped by the database before you can sign off or if you have to break communications because of technical problems, you will not be able to get a time or charges summary. In that case, record the approximate time you were on-line before leaving. Save this and compare it with the time shown on your next bill. If there is a significant difference, contact the database vendor for credit. As many of them also want to see what happened, save the search, either on disk or in print form. This way you can show what happened and avoid unpleasant surprises. The same is true if the database is not performing properly. For example, you may find that you cannot search a particular field which the database aids say you can. The result may be excessive and uncontrolled charges. Here also, save the entire search so you can seek a credit from the database vendor.

NONPROFIT SOURCES

In the past, you could expect to get database research done by public or private libraries at no cost or at low cost. This is changing, in part due to the continued cost pressures on such institutions, and in part because people perceive these institutions as lacking the skills needed to conduct sophisticated searches. Those institutions which do such work will often restrict their work to members. In addition, they are not as time-oriented as many business persons would like. However, if a private library or trade association research facility offers on-line searching as a membership benefit, consider using it. When you do, establish quite clearly the following:

- Will they do the search at your verbal request or do you have to be there in person when they do it?
- Are the results confidential?
- What control do you have, if any, over what databases are searched and over what periods?
- Who designs the search? How well trained are they?
- What are the costs and turnaround times? Do they limit the number of hits they will produce for you? If so, on what basis? If the search is limited to the "most current" data, how do they define that term? If limited to the first ten or twenty hits, you have no idea how many total hits there may have been if the database was searched thoroughly.
- Will they contact you if they have questions about the search or just run what they have been given?

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How to Look It Up Online

In this report:

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This report will help you to:

- Best use a vendor's customer service staff for search assistance.
- Mentally plan an online search strategy.
- Understand the elements that make up an online citation.
- Formulate a search strategy to best advantage.

There are two essential elements to successful online searching. The first is your mental approach to the problem at hand. The second is your familiarity with the tools available to get the job done. The mental element is the more important of the two. Indeed, it may be the most important factor of all. It's certainly the most difficult to explain, which is probably why articles about online information retrieval tend to skip over it and concentrate on search commands and other tools.

In this report, however, we'll start with a discussion of how to develop the proper mental approach; then we'll discuss the major tools and techniques you need to start searching. We will use DIALOG as our main example; however, the concepts and approaches apply to all databases, even those that, like NewsNet, NEXIS, VU/TEXT, and most of Dow Jones, are not based on bibliographic citations and abstracts.

We'll conclude with a step-by-step guide to conducting a successful online search as illustrated in Table 1. We will be referring to that table frequently in this report, so we've placed it at the very end for easy reference.

Preliminaries

Open a manual published by one of the database vendors and you'll find a great deal of information about search language, command syntax, and all the wonderfully intricate things you can do with the system. Unfortunately, if you are new to the field, an explanation of a full-powered search language in all its glory is about the last thing you need

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This Datapro report is a reprint of "How to Look It Up Online: Tools and Techniques for Searching Any Database," pp. 87-123, from *How to Look It Up Online* by Alfred Glossbrenner. Copyright © 1987 by St. Martin's Press, Inc., New York. Reprinted with permission.

to see. The concepts are new. The commands are strange. And everything appears to have equal weight—you have no idea which portions of the manual are important and which commands and features you can safely ignore.

Ignore Everything

We suggest that you begin by ignoring all of them. We'll show you how to get started and what commands to look for later. For the moment, accept it on faith that if you can use a computer program like PFS:File, dBASE, or Lotus, you won't have much difficulty learning to use DIALOG, BRS, or ORBIT. Or any other information retrieval system. In fact, the computer programs may present the greater challenge.

Instead of trying to master all the commands at once, learn the commands as you need them. After you've done a little searching and gotten a feel for what it's like, after your mind has become actively engaged, you'll begin to ask questions: "I wonder if there's a way to focus my search on a particular magazine . . . How can I search a range of dates instead of just a single year? . . . Is there a way to focus on the subject of plastics without including PVC or Styrofoam?"

You will discover that there are ways to do all of these things, and many more besides, on almost every system. But by waiting until you actually need these tools to find out about them, you will prevent the occurrence of that helpless, I-can-never-learn-to-do-this feeling that's inevitable if you try to absorb everything at once. Equally important, you'll have a strong motivation to learn the command since you will need it to solve a problem. You'll also have a much better sense of where it fits in the overall framework of the system.

Call Customer Service

The best way to find the answers to questions about how to use a system is to start by spending just a few minutes with the database vendor's manual, then call Customer Service. The information industry, unlike the computer hardware and software industries, has always put a heavy emphasis on telephone support. They've got the toll-free lines, the trained staff, and the years of experience to do the job right. It's part of what you're paying for when you use an online system.

Often, a customer service representative will not only tell you what commands to enter, he or she will enter them at a nearby terminal to test them for you and make suggestions on how to improve the results. You can then hang up, sign on to the system, and enter the same commands "cookbook" fashion.

IP Support

The vendor's hot line is only your first option. There is an entire second level of customer support provided by the database producers. Many IPs publish and sell their own reference manuals. The manuals and other materials explain how the database is set up, what it includes, and how to use any special codes or controlled vocabulary terms for precision searching. Many IPs also maintain their own customer support hot lines, many of them toll-free. In fact, though it will stunt the growth of your information retrieval skills, you can often phone an IP with nothing more than a question like "How can I find information on Company X?" and receive a complete, blow-by-blow set of instructions on what commands and search terms to enter on a given system.

Mental Approach: the Five Rules of Search Success

Imagine that you've been parachuted into the central reading room of the Library of Congress in Washington for a night raid on its strategic information reserves. Your mission, should you decide to accept it, is to come out with everything you can find on industrial robots, particularly as pertains to their use in automobile assembly lines. Should you fail, your secretary will disavow any knowledge of the mission. "Impossible," you say. "Where in the world do I begin?"

Rule 1: Respect Your Opponent

You begin by developing a healthy respect for your opponent—the vast quantity of information that's out there. With so much information now online, it is exceptionally easy to simply dive in and drown.

Consider all the various forms information on industrial robots could take: general interest, trade, and technical newspapers and magazines; specialized newsletters; doctoral dissertations; conference proceedings; books; government studies; films, filmstrips, and video tapes. Multiply all of these by the number of industrialized countries in the world, and you can begin to appreciate the scope of what's available on this topic alone.

Rule 2: Define Your Target

One of the biggest mistakes new searchers make is to go online without a clearly defined idea of what they're after. If you do this, your information opponent will swallow you alive. For example, we searched *Business Week* on the ABI/INFORM database (See Table 1) and discovered that there were nearly 19,000 articles containing the word industrial, over 1,200 containing the word robot or robots, and 150 containing the phrase "industrial robot(s)." That's one magazine out of the 680 that ABI/INFORM covers, and we limited things to just the last two and a half years.

You may have an image in your mind of what you want to know about industrial robots, but a database computer is just a dumb machine. It will gladly do your bidding. But you've got to tell it exactly what you want. When a computer comes back with too many hits on a topic, you can't say, "C'mon, you know, 'industrial robots,' like they use to put cars together. Get with it!"

Consider just a few of the various topics and subtopics that might be relevant to industrial robots: cost-savings, mean time to failure, maintenance expense, labor relations, occupational safety, use on assembly lines, use in hazardous applications, use in Japan, manufacturers of, planned acquisitions of, history of, industrial robots and the future, and so on.

Get the image of what you want out of your mind and translated into words on paper. Those words (search terms) are your weapons, and you create them by asking yourself questions: What subtopics could exist? Which ones am I interested in? Which ones do I want to avoid?

Rule 3: Consider the Source: Who Would Know?

From your vantage point at the center of the Library of Congress, you now have a greater awareness of the quantity and variety of information that surrounds you. You've also clarified your target. You're ready to start searching.

You could start with a methodical inventory of the resources at your disposal. The card catalog over here, the magazine and newspaper racks over there, several thousand books from A to Absinthe in the stacks across the room, right next to several thousand more from Absolute to Accipiter.

It's much more productive to ask yourself, "Who would publish this kind of information? And how would each type of publication treat the topic?" In other words, instead of allowing your actions to be limited and channeled by what happens to be close at hand, whether it's a collection of databases or a collection of books, take control of the situation. This forces you to focus on the source material, and that has a number of benefits.

First, it emphasizes the fact that the information in an online database, whether it corresponds to a printed publication or not, has to come from somewhere. It isn't enough for an IP to say, as many do, "We've got a business database! Come search! Come search!" If information is to have any value, you've got to know where it came from. Is it from a reasonably impartial government study, a guaranteed-to-be-partial trade group, a reputable magazine or some rag you've never heard of, a newspaper with a particular viewpoint to sell, or what? Would you make an important decision or a substantial investment on the basis of a report from some firm you'd never heard of? Of course not.

Second, focusing on source material is one of the most important steps you can take toward insuring successful online searches. For example, *Business Week*, *Scientific American*, *Automotive Industry*, and *The New York Times* could all be expected to publish information on industrial robots. And you know, almost without thinking about it, that each one is going to take a different angle on the story.

Business Week would probably supply lots of business-oriented, industry-impact statistics. It might also single out a few key robot manufacturing firms and interview their executives. *Scientific American* might mention the economic implications as well, but it would focus on the technical aspects of how such robots work. As a trade journal, *Automotive Industry* could be expected to contain performance statistics, operating costs, announcements of planned installations, and labor union reaction to specific robot-related issues. The *Times* coverage would be similar to that in *Business Week*, and though it wouldn't be as deep, it would undoubtedly cover "impact on society" issues.

Certainly there would be some overlap in the kinds of coverage, but in general, this kind of logic is sound. If you know from years of reading *Business Week* that it could be expected to produce exactly the kind of article you want, it surely makes sense to search a database that covers *Business Week* and comparable publications.

Rule 4: Don't Go Online Unless You Have to

Databases don't always offer the easiest solution to your information problem. It is crucial to be aware that an electronic database is only one of many options, part of a continuum of information tools that includes all of a library's standard reference, index, and directory volumes (some of which are online), encyclopedias and handbooks, the card catalog, interlibrary loan programs, and every other library resource, especially the librarians. This continuum also includes the telephone and the U.S. mail.

There are lots of times when you will have to go online, of course. But when you've got a question, you might also ask yourself: "Who would know about this kind of thing?" One of your friends, contacts, or business associates? Maybe they know somebody who knows somebody you could call. No luck? Okay, let's go online. But instead of trying to find the actual information you need, consider using the online tools to find an expert who can tell you what you want to know.

When you're looking for an expert, you'll frequently discover that the nation's magazine and newspaper reporters have done much of the work for you. If you search for even general stories on a topic, you'll find that most will quote one or more experts and cite his or her credentials and affiliations. The stories will also give you important background information and alert you to issues you may not have considered. When you use a database in this way, it doesn't much matter whether the abstract or referenced article contains the exact facts and figures you're after. If it contains the name of an expert or recognized authority, you've got the entry point you need.

Sign off the system, pick up the phone, and call directory assistance to get the telephone number of the university, corporation, consulting firm, or other organization with whom the individual is associated. You may have to make several calls. The expert may or may not be able to help you. But the chances are that he or she knows someone who can and probably has that individual's phone number in the Rolodex. When you do make contact with the right person, you'll be able to ask questions and explore topics in a way that you will never be able to do with a computer.

Elementary, My Dear Database

When searching for information, it generally makes good sense to turn first to those publications and sources you know best. But of course no one can be familiar with every information source. The real challenge, and much of the satisfaction, comes when you apply your Holmesian powers of deductive reasoning. For example, if you're aware that almost every industry has a trade journal of some sort, you can deduce that one exists for the industry you are interested in without ever having seen or heard of it. Similarly, you can assume that most industries have at least one trade association. Even if it is a small industry, you can assume that some investment banking concern has prepared a detailed report on it, or on one or more of its leading companies. You can also assume that it falls under the jurisdiction of a governmental body somewhere that has probably prepared a report on it.

What are the names of the leading companies? Who are the executives of those firms? Is it possible that one or more of them has been quoted in a national magazine? In a local or regional newspaper? Have any of them written a book on their experiences? You can obtain all of this information and much more from online databases.

On Becoming an Information Detective

Information retrieval, in short, is anything but a passive activity. It is a skill that requires imagination, brainstorming, curiosity, and an ability to combine and extrapolate what you know into areas you have never explored.

For example, consider the problem of getting financial information on privately held companies. Because they do not sell securities to the public, privately held companies are not required by law to publicly reveal their balance sheets, income statements, and other financial data.

At first blush, you might think, "Well, that's that. No way to get the information." But one shouldn't give up so easily. Instead, ask yourself: "Are there any circumstances under which a private company might voluntarily report its financials to someone? How about when it is applying for a loan? Come to think of it, don't most companies at one time or another have to fill out a credit report before their suppliers will do business with them? Who would have that kind of information?"

If you're a businessperson, you can probably make a pretty good guess at the answer: Dun & Bradstreet, the country's largest credit reporting organization. Certainly it is worth a phone call to Dun & Bradstreet to see if the information you want is available. Knowing what you now know about electronic information, it is also worth checking one or more database catalogs to see if the information is online.

Either way, you would almost certainly discover a file called D&B-Dun's Financial Records. Available on DIALOG, this file contains financial information, sans credit and payment history, on some 700,000 firms, 98% of which are privately held. If you need credit and payment history information as well, you can get that through the NewsNet gateway to TRW, D&B's main competitor. The cost is $29 per report.

Of course things rarely work out as neatly as in this example. And no one is suggesting that you should have been able to arrive at the same solution on your own. The point is the process. The most successful searchers are those who adopt the creative, imaginative approach of an information detective.

Rule 5: Know Your Database

Let's assume that you've unbuckled your parachute and buried it deep within the Library of Congress stacks. You've decided to start your search for information on industrial robots in the automotive industry by going online and searching publications like *Business Week*. You notice a PC and modem conveniently located on a nearby reading table. You boot up and see a blinking cursor on your screen. Now what?

How do you know which databases to search? How do you know which ones cover *Business Week* and similar publications? It would be wonderful if there were a master database of databases that could give you an instant list of every database that covers a specific topic or every database that includes a particular publication. Someday such a product may exist, but there is no such thing today.

Instead, there are printed database directories, several of which are also online. There are the vendor catalogs with their short descriptions of the databases on their systems. There are lists of the journals covered by individual databases, available from database producers. There is a *Directory of Periodicals Online* published by Federal Document Retrieval, Inc. Also there are DIALINDEX, CROSS, and DBI, the files maintained by DIALOG, BRS/SEARCH, and ORBIT to help customers choose a database on those systems. (DIALINDEX is not available to DIALOG's Knowledge Index customers, however, and CROSS is not part of BRKTHRU.)

You might start by consulting one of the printed database directories. All of them are indexed by subject, but the subject headings are broad: real estate, science and technology, news, research in progress, and so on. Some of the database write-ups they contain mention the journals covered, but you can't count on it, and only a selected list is given in any case.

The directories are very helpful, but if you're a new searcher, you might be better off starting with the catalogs and other materials available from database vendors. When you've found the databases that sound like they would cover the publications and topic you are interested in, phone or write the database producer for more information. Be sure to ask for the list of publications that it covers.

Ultimately, the only way to become an effective searcher is to become familiar with the databases and online systems that focus on your fields of interest. Remember, each database is a separate product, just as each computer program is a separate product. You can't expect to bring yourself up to speed on all of them overnight. As with computer software, you will probably begin by using two or three databases fairly frequently and thus get to know them well. Gradually, you'll branch out, and as your familiarity grows you'll add more databases to your repertoire.

You may find the databases you start with contain most of the information you need to start searching immediately. But remember, there's no substitute for the information and journals lists available from the database producer.

Tools and Techniques

Fields Are the Key

Databases like DIALOG, BRS, and ORBIT consist of files, records, and fields. Most other databases use similar divisions, though they may not call them by those names or permit you to search them in the same way. Of these information components, the most important are the fields. Indeed, it would be nice if we could make the word field on this page blink on and off in emphatic red neon. It's the key to the whole shootin' match. Records are what you are after when you search a database, and fields are the only way you can hit them.

Clowns in a Cage

It's like the carnival game where the object is to dump the pretty girl, good-looking guy, or clown into the water by hitting a target with a baseball. You know someone's there. You can see him or her through the protective cage. But you'll never knock them into the pool unless you hit the target.

In the carnival game, there is only one target. In a database record, there are many. That's important; because the more fields a record contains, the more precisely you can focus your search. Needless to say, the number of fields a record contains is up to the database producer.

Imagine a database created from your address book or Rolodex cards. If there is a field in each record for "Phone Number," you could tell the database software to retrieve every record containing the phone number "800-555-1212." That's not terribly useful. After all, how often do you know someone's phone number but not his or her name?

Suppose we break up the phone number into more precise fields. Suppose we restructure the records so that there is a field for "Area Code" and one for "Phone Number." If you were planning a trip to Los Angeles and wanted to be sure to call all of your friends when you're there, you could easily produce a comprehensive list. Simply tell your database software to retrieve every record in the file in which "Area Code=213."

Now, look at the record from ABI/INFORM that's shown in Table 1. The abstract paragraph starts with the words, "Just as Ford Motor Co.'s assembly line . . ." Each of the single lines above the abstract is a searchable field: title, author, journal name, publication date, code number, International Standard Serial Number, document type, and language. "Availability" means you can order a photocopy of the original article from ABI/INFORM, and in this database, it is not searchable.

The abstract also represents one searchable field. So if you happened to search on the term "automaking," you would hit this record, since that word can be found in the eighth line of the abstract.

The DESCRIPTORS field is also searchable. The descriptors are anything but a random ad hoc collection of words. They are keywords that have been chosen from a predefined list by professional indexer/abstracters and assigned to the record.

The last searchable field is CLASSIFICATION CODES. To make retrieval even easier, a number of database producers assign special codes to their records. Sometimes, the identical set of codes is used by several producers, but more often each producer creates and defines a unique list. The codes are hierarchical, meaning that the more nonzero digits a code includes, the more specific the topic to which it refers. Code 5200 refers to the broad heading of "Communication & Information Management." Code 5240, the first one listed in the record shown here, refers to "Software & Systems," a subtopic of the Code 5200 topic. All of this is explained in the user's manual published by ABI/INFORM.

> *Online Tip:* Starting with the June 1986 update to the file, ABI/INFORM began including two additional fields and two new Industry and Marketing Classification codes. The two new fields are Company Name (/CO and CO=) and DUNS number (DN=), the "Social Security" number assigned to most corporations by Dun & Bradstreet. The two new codes were 8301 for Advertising Agencies and 8302 for Software & Computer Service Industry.

The point is that these fields are your targets. Throw the right words or code numbers at them and the record will be dumped in your lap. In a moment, we'll show you how to select the right words and how to enter them into the system. But before we can do that there are two other topics to explain.

DIALOG's Basic and Additional Indexes

To search ABI/INFORM on DIALOG, you first look up the database in the catalog and note its file number (File 15). Then you sign on to DIALOG and enter BEGIN 15. That puts you into the database. Next, you enter your search terms with the command SELECT followed by the term. You may also enter the command SELECT SETS. The Command may also be referred to as SuperSELECT or SELECT STEPS. This is the command you should probably use. It tells the system that you want it to assign a set number to the results of each search term. That saves you the trouble of retyping each search term when you enter subsequent commands, since you can use the set number (S1, S2, S3, etc.) instead. We'll have more to say about this later when we explain Table 1 in greater detail. Both commands may be abbreviated to S and SS, respectively.

We've said a lot about fields, but suppose you signed on and simply entered SELECT ROBOTS. What would the system do? The answer is that it would search the Basic Index. Every file on DIALOG has a Basic Index consisting of one or more of the fields in each record. It's kind of a preselection of fields, which one can only assume is intended as a convenience.

The fields that are included vary with the file, but they are always listed on the appropriate DIALOG Bluesheet. In the case of INFORM, the system would search the abstract, descriptors, and title fields, since they compose the Basic Index for the file. Everything else—the fields for author, classification code, journal name, and so on—is considered part of the Additional Indexes group.

> *Online Tip:* In our opinion, the Basic Index on DIALOG is not convenient at all. In fact, it is a drawback because it complicates things. If you want to search for articles in a particular magazine, for example, you can enter JN = (for "Journal name equals") followed by the name of the magazine. You can do this because the journal name field is one of the Additional Indexes. But if you want to search for a particular descriptor, say "automated," you must use a suffix instead of a prefix and enter it as AUTOMATED/DE, all because the descriptor field is part of the Basic Index. Wouldn't "DE = AUTOMATED" make more sense? Unfortunately, that's not the way it works.

ABI/INFORM is also available on BRS/BRKTHRU, where it has approximately the same searchable fields. But on BRKTHRU, when you enter a search term without qualifying it in any way, the system searches all of the fields, not just a basic index selection.

ABI/INFORM is also available on BRS/BRKTHRU, where it has approximately the same searchable fields. But on BRKTHRU, when you enter a search term without qualifying it in any way, the system searches all of the fields, not just a basic index selection.

Field Abbreviations and Labels

Each field in a bibliographic database, whether on BRKTHRU, DIALOG, ORBIT, or some other system, has an assigned abbreviation. You'll find these on the DIALOG Bluesheet for each database and in the documentation supplied by the other database vendors. In Table 2, for example, you'll find the field abbreviations for all searchable fields in the ABI/INFORM database. You can generate an instant list of the searchable fields for any database on DIALOG by entering the command ?FIEDLDn, where *n* is the file number. You can do this at any time, regardless of the file you happen to be searching.

You can enter the ?FIELDn command at any time on DIALOG to get a list of the searchable fields for any file on the system. Notice the abbreviations that are used for ABI/INFORM fields in Table 2 and the examples that are included.

What's in a Field?

If fields are your targets and keywords (search terms) are your weapons, the next point to consider is how you choose the right fields and select the right words to hit the records you want. Not surprisingly, there's more to this than meets the eye, for the fields and words you choose influence each other.

The place to start is with the question: What kinds of words can I search for in each field? You will find complete explanations of the type of information you can expect to find in each field in the appropriate DIALOG documentation chapter for the database. All such chapters begin with a general explanation of the file and the Basic Index. They then explain each searchable field in turn. The chapters always conclude with several search examples and a list of an additional documentation or search-aid material that may be available.

This is why we recommend DIALOG database chapters so highly. The documentation from other vendors carrying the same databases cannot compare. With minor translations, you can use the DIALOG chapter as a guide to searching the database on any other system. Here, we'll look at the general categories of information you can expect to

Table 1. ABI/INFORM Fields on DIALOG

??FIELD15

?FIELD15

Prefix-Coded Fields (EXPAND	or SELECT)
Field Name	Example
Author	AU=MORANT, ADRIAN?
Classification Code	CC=9170
CODEN	CD=TPEMAW
Classification Name	CN=ADVERTISING AGEN?
Company Name	CO=BROADVIEW FINANC?
D-U-N-S Number	DN=05-944-1428
Document Type#	DT=JOURNAL PAPER
Journal Code	JC=TEM
Journal Name	JN=QUALITY PROGRESS
Language	LA=ENGLISH
Publication Date@	PD=860101
Publication Year	PY=1986
International Standard Serial Number (ISSN)	SN=0040-263X
Update	UD=8601W1

Basic Index Fields (SELECT	only)
Field Name	Example
Abstract	CELLULAR (3N) COMMUNICAT?
Company Name	BOSCH (1N) ROBERT/CO
Descriptor*	MOBILE (W) RADIOS (W) TC/DE
Title	MOBILE (W) MARKET/T1

#DT=JOURNAL PAPER is the only document type used at this time.
Over 99% of the records are indexed to LA=ENGLISH.
@ Also cascaded to four digits, e.g., PD=8601.
**Also /DF.*
***Sortable Fields**Online (SORT) and offline (PRINT).*
AU, CO, JC, JN, PD, PY.
SORT 4/ALL/AU/TI
PRINT 5/3/ALL/JN

find in various fields with the understanding that you should consult the DIALOG database chapter and any additional documentation from the IP for specific details on any database.

Controlled Vocabulary

As explained previously, many IPs use limited lists of words and phrases to tag records that refer to articles on particular topics. Sometimes an IP will start with a widely used list like the Library of Congress Subject Headings (LCSH) and modify it to suit. Other IPs will create a list from scratch. The words themselves may be called indexing terms, descriptors, or something else, but all of these names refer to the same thing. Together, the words on an IP's list are called a "controlled vocabulary" because a professional indexer/abstracter may use those words and only those words when assigning indexing terms to a record. The one instance where this is not the case is in the IDENTIFIERS field found in some DIALOG databases. When used, identifier fields contain supplemental words that are not part of the official controlled vocabulary.

The specific words on a controlled list don't make all that much difference in and of themselves. You can think of them as code numbers if you like. The crucial point is that the IP uses a particular defined list. Thus, if you search the ABI/INFORM descriptor field for "automobile manufacturer", "car", or "assembly line", you will not find any records. Those terms are not in INFORM's controlled vocabulary list or "thesaurus." But if you search the field for "automobile industry," you will have much joy since that term *is* on the list.

The only way to obtain the thesaurus for a database is to contact the database producer. In most cases, you'll have to pay for it, though it will probably come as part of a complete manual. The vendors do not supply database thesauri.

Unique Code Numbers

The code number concept is the same as that of a controlled vocabulary. ABI/INFORM and the various Predicasts, Inc., databases, among others, make extensive use of code numbers. There are codes for companies, major topics, subtopics, "events" like the announcement of a new product, codes for specific types of products, and so on.

The code numbers can be used exactly as you would use controlled vocabulary terms. You look up the topic you want on an IP-supplied list, note the corresponding code, and enter the numbers in your search statement.

The main advantage of codes is that they tend to be quite precise and they are usually hierarchical. Thus, as noted previously, with ABI/INFORM you can say, "Give me every record with an assigned classification code starting with 52" and pick up every record in that broad category (Communication & Information Management). The codes may be "cascaded" as well, as is the case with Predicasts databases.

"Universal" Codes

Databases may also incorporate as searchable fields certain widely used and universally accepted codes. The codes may have been developed by the U.S. government, international standards organizations, or private companies. The most widely used code sets include:

SIC Codes—Standard Industrial Classification Codes

Usually pronounced "s-eye-see" codes. Originally produced years ago by the Office of Management and Budget (OMB) for statistical purposes, SIC codes have been widely adopted throughout the economy as a convenient means of classifying goods and services. These are four-digit hierarchical codes (each digit to the right signifies a greater degree of specificity). For example, Code 54 is the broad major group code for food stores. Code 542 narrows things down to meat and fish markets. Code 5422 is more specific still: freezer and locker meat provisioners.

To information professionals, SIC codes have two drawbacks. First, they are not specific enough for many retrieval purposes. Second, the code list is not updated and revised fast enough to keep up with new businesses and products. At this writing, the last major revision of the codes was published in 1972. (The revision scheduled for 1982 was canceled.)

To help ease the situation, the Census Bureau in 1982 created a seven-digit coding system for the principal products and services of U.S. manufacturing and mining industries. The system "represents an extension, by the Bureau of the Census, of the four-digit industrial classification" as defined by SIC codes. In other words, the first four digits are the same as SIC codes. The additional three digits provide greater specificity.

> *Online Tip:* For those who are already familiar with the SIC system, the Census Bureau codes cover major groups 10 through 39. You can get a list of them for $6 from the Government Printing Office (GPO). The title to ask for is *1982 Census of Manufacturers and Census of Mineral Industries: Numerical List of Manufactured and Mineral Products* (Reference Series: MC82-R).

The complete list of four-digit SIC codes is available from the U.S. Government Printing Office (GPO). Contact the GPO and ask for the *Standard Industrial Classification Manual.* It's 650 pages long, hardbound, and weighs in at 2 pounds 14 ounces. The cost is $15. A 15-page supplement prepared by the Office of Federal Statistical Policy and Standards (Commerce Department), which now has responsibility for the SIC project, is also available for $2.75. As an alternative, you might want to consider ordering a copy of the list created by Predicasts, Inc. Predicasts codes correspond to the SIC list to four digits, with three additional digits added by the company. The list is widely accepted and used by many companies for internal operations.

MSA (formerly SMSA)—Metropolitan Statistical Area

These codes were introduced in June 1983 by the Census Bureau as a replacement for Standard Metropolitan Statistical Area codes. An MSA is a geographic area with a "large population nucleus that includes surrounding counties which have a high degree of economic and social integration with that nucleus." Basically, your major cities and surrounding suburbs, each group of which has been given a code number by OMB. There are over 300 of them.

Some database manuals have complete lists of the MSA codes. But you will also find them in the *BLS Manual of MSA Codes: Metropolitan Statistical Areas (as defined by OMB June 30, 1983), Primary Metropolitan Statistical Areas, Consolidated Metropolitan Statistical Areas.* Variant Title: *B.L.S. Manual of M.S.A. Codes.* Write to: Commissioner, Office of Field Operations, Bureau of Labor Statistics, 441 G Street, Washington, D.C. 20212.

ISSN and ISBN—International Standard Serial Number and International Standard Book Number

The "serial" here is serial as in magazine and other regularly issued serial publications. These are unique identifying numbers assigned under the auspices of the International Standards Organization of the United Nations.

DUNS or D-U-N-S Number—Dun's Universal Numbering System

Created by Dun & Bradstreet as part of its credit reporting operation, a DUNS number is like a Social Security number for a company or business establishment. This is an especially convenient system since, when a database uses DUNS numbers, you don't have to search for a company using every possible variation of its name. With a DUNS number, there can be no doubt. There is no relationship between the DUNS number of a parent corporation and its subsidiaries. The numbers are randomly assigned.

Inverted Files and the Expand Command

The majority of codes and controlled vocabulary terms you can use to search various fields can be found in the manuals and documentation published by the database producer. If you were interested in finding the abstracts in the ABI/INFORM database that referred to articles about car companies, you would first open the *Search-INFORM* manual that ABI/INFORM sells for $47.50. The manual contains an 8,000-word thesaurus of controlled vocabulary terms. As noted previously, the correct term to use in the descriptor field in this case is "automobile industry." You would then sign on to DIALOG and BEGIN 15 to get into INFORM and key in SELECT AUTOMOBILE INDUSTRY/DE.

That's the least expensive way to do it. But there is an easier way. With the DIALOG EXPAND command you can rapidly check to see if any term is in a database's controlled vocabulary. You can do many other things with EXPAND as well, but we'll stick with this one for the time being. Similarly, you can use the ROOT command on BRS/SEARCH, the STEM command on BRS/BRKTHRU, and the NEIGHBOR command on ORBIT. Virtually everything we are about to say about EXPAND applies to these systems as well.

Inverted and Linear Files

The key to understanding the EXPAND command is the concept of the "inverted file." When a database is loaded into an online system, every record it contains is given an "accession number," which we can think of as its address. This is so the system knows which disk drive, which cylinder of the disk, and so on to go to to find it again. All of the records in the database make up what can be called the "display file." The display file is a linear or sequential file, and it is the source of the information you see on your screen when you look at a record online.

However, at the same time the display file is loaded, a second file is created. To make this file, the records are torn apart word by word, and the words are reassembled in alphabetical order. Each word on the list carries the address of its parent record and its numerical location within the record. This is the inverted file. Since it contains virtually every word in the display file, plus a certain amount of software overhead, it is usually about 120% the size of the display file. This is the file that is searched when you SELECT a keyword.

Conceptually, if you enter the word TANGERINE, the database system zips through the alphabetical inverted file, locates that word, notes the record address attached to it, and goes and gets the record that contains it from the display file. In information industry terms, the system can only find words that have been "posted to the index" (made a part of the inverted file). Thus "hits" are often also called "postings."

Actually, there is more than a single inverted or "index" file for each database. There is one for each searchable field. Also, the mainframe search system software uses sophisticated algorithms to get close to the target word without having to scan the entire list. Since even full-text databases are treated this way on systems like Dialog, BRS, and ORBIT, it normally doesn't take any longer to search a full-text file than one consisting solely of bibcites. The mainframe search system never has to read through every word in a sequential file looking for a match the way many personal computer database programs do.

Checking It Out Online

When you enter the command EXPAND followed by a search term on DIALOG, you are actually asking the system to show you an inverted file for the database. For example, here are several terms in the Library of Congress LC MARC database. The terms are all alphabetically close to "conglomerate corporations," the term we expanded:

EXPAND CONGLOMERATE CORPORATIONS

Ref	Items	Index-term
E1	76	CONGLOMERATE
E2	1	CONGLOMERIT CORPORATION

Ref	Items	Index-term
E3	68	CONGLOMERIT CORPORATIONS
E4	1	CONGLOMERATE MERGERS
E5	1	CONGLOMERATE MERGERS: CAUSES, CONSEQUENCES, A
E6	1	CONGLOMERATE MERGERS—THEIR EFFECTS ON SMALL B
E7	9	CONGLOMERATES
E8	1	CONGLOMERATES AND MULTINATIONALS IN INDIA A:
E9	1	CONGLOMERATES AND THE EVOLUTION OF CAPITALISM
E10	1	CONGLOMERA TEURS
E11	1	CONGLOMERATEURS AND THEIR CONGLOMERATES: DIVE
E12	1	CONGLOMEROID

The "items" column refers to the number of records in the database that contain the index term shown in the rightmost column. Note that EXPAND causes the system to look for literal matchups with what you key in. Thus, if you entered CONGLOMERIT CORPORATION? above, you would see "E3 0 *CONGLOMERIT CORPORATION?" but the surrounding words on the list would still appear.

DIALOG always lists your EXPAND term as E3, marks it with an asterisk, and shows you the two terms preceding it on the index list. The system presents a total of 50 terms for each EXPAND, displaying them about 12 at a time with a prompt to hit a key if you want to continue. That makes it easy to cruise through the list.

EXPANDing by Field

If you enter an EXPAND term without qualifying it, as we just did, the system displays the inverted file for the Basic Index. But you can also EXPAND by field. As with ABI/INFORM, there is an author field (AU) in this database. For example, suppose you wanted to find books written by Peter F. Drucker. Should you search on "Drucker, Peter." or "Drucker, Peter F." or "Drucker, P.F.?" Let's EXPAND on the AU field to find out:

EXPAND AU=DRUCKER, PETER

Ref	Items	Index-term
E1	1	AU=DRUCKER, MORT
E2	16	AU=DRUCKER, PETER FERDINAND
E3	0	*AU=DRUCKER, PETER
E4	1	AU=DRUCKER, REUVEN
E5	1	AU=DRUCKLER, JENS

Nope. "Drucker, Peter" is not the right form of name to use. Had you simply signed onto the database and entered it after a SELECT command, you would have gotten zero hits. But as you can see, there are 16 records in this database listing "Drucker, Peter Ferdinand" in the author field. Actually, you don't even have to know the author's first name. Keying in EXPAND AU = DRUCKE would have also led to the complete proper name.

Sleight of EXPAND

You might think of EXPAND and the terms it presents as sort of a dictionary sitting at your side as you sit at a database's control panel. You can turn away from the control panel, open the dictionary, and look something up at any time. But to use what you've looked up for searching, you've got to turn back to the panel and key it in. Entering the command SELECT signals to the database that you've closed the dictionary and are back on station.

If you want to retrieve records containing CONGLOMERATE CORPORATIONS, you've got to get that phrase into your search stream. There are two ways to do this. You can either enter SELECT followed by the phrase. Or you can save yourself some keystrokes and simply enter SELECT E3, the reference number for the phrase from your EXPAND list. The system will blink and notify you in seconds that you have 68 hits. Those are the same 68 revealed by the EXPAND command, but now they're in the search stream, and you can go to work paring them down by adding qualifiers.

Just remember that the system resets the list each time you do an EXPAND. Or to put it another way, each new EXPAND cancels the one the preceded it.

Entering Search Terms

We've looked at the idea of fields. And we've looked at the kinds of information you can expect to find in various fields. The final step is to actually enter the terms you want to search for in the database.

There are a number of general points to keep in mind here. The first is that there are some words you may not use. The industry calls them "stop words" or "noise words." The exact list varies with the system, but it usually includes words like these: the, to, with, from, for, of, that, who, and all of the Boolean operators (AND, OR, NOT). Should you need to use a stop word as part of a search term, some systems will let you search for it if you set it off in quotation marks ("The Man Who Came to Dinner").

The second and even more crucial point is that computers are absolutely dead-bang literal-minded machines. To a computer, one string of characters is like every other string of characters. So if you enter a misspelled word, you won't get any hits, since the machine will look for exactly what you enter.

There is a corollary to this as well. Any time it is possible to spell or abbreviate a name or a word more than one way, you can assume that both or all variations have been used in the database. For example, look at the abstract in Table 1 and consider the potential variations in the terms found in just the first sentence: Ford Motor Co. or Company, US or U.S. or United States, General Motors Corp. or Corporation, Saturn Corp. or Corporation or perhaps "Division" or "Company" or something else. Government agencies are another good example: SEC, S.E.C., and Securities and Exchange Commission all refer to the same agency, and all three variations may be used in the same database.

The best way to deal with this problem is to pause and think about potential variations and abbreviations. Then make liberal use of the EXPAND command to check for them. As your system manual explains, you can pick up any quantity of EXPAND "E" numbers and put them into your search stream. You can also pick up a range of these numbers by using a colon (SELECT E7:E12).

A Question of Quality

The question of quality is something that the industry doesn't talk much about. But the fact is that due to data-entry errors, most databases are littered with landmines that can easily blow up in an unsuspecting searcher's face. If someone has miskeyed or misspelled a word when entering the record, you may end up retrieving and paying for it even if it isn't remotely related to what you are searching for.

One can deal with that. A far more troubling problem is the database's unintended use of Stealth technology to make records invisible to conventional search techniques. For example, the REMARC database includes all the works cataloged by the Library of Congress (LC) from 1968 back to the sixteenth century, some 5.2 million volumes in all. When the file was searched on this author's rather unique last name, an 1834 history of York County, Pennsylvania turned up as did an 1892 pamphlet by a great-grandfather and namesake. But there was also a record that is of interest for more than just personal reasons:

```
0622392 LCCN: 37008722
The life of Bishop J.J. Glossbrenner, D.D. of the United
brethren
in Christ, with an appendix
containing a number of his sermons and sketches
Drury, Augustus Waldo,, 1851-
Dayton, Ohio, Published for J. Dodds by United breth-
ren publishing house,
1889, xv, 17-391
p.incl. front. port. 19cm
Place of Publication: Ohio
LC Call No.: BX9877,G607
Languages: English
Document Type: Monograph
Geographic Location: United States
Named Person: Grossbrenner, Jacob John bp 1812-1887
Descriptors: United brethren in Christ-Sermons; Ser-
mons, American
```

First, look at the "Named Person" field (second line from the bottom). The record is presented exactly as it was downloaded from REMARC, and the named person ("Grossbrenner") is obviously wrong. If you were to search with the command SELECT NA = GLOSS? to tell the system to search that field for anyone whose name began with GLOSS followed by any other letters you would *not* retrieve this record.

The mistake could have been made by the person who keyed this information into the database. Or that data-entry operator may simply have duplicated a mistake made in 1889 when the original LC card from which the REMARC record is derived was typed up. However such mistakes happen, there is virtually no way to catch them. How can you think of every possible misspelling of a name or a word?

Nor is REMARC unique. *All* databases are to one degree or another plagued with this problem. You have only to look at Table 1 for another example. We EXPANDed the partial word AUTOMOB in ABI/INFORM, but as you can see by looking at E4, there is at least one record in the database where "automobile" has been keyed in as AUTOMOBIEL. And we've got our doubts about E12. Unless a new compound word has been invented, it should probably be AUTOMOBILE WORKERS. We don't know anything about these two records (E4 and E12). But we do know that if you spelled the word(s) properly, you would *not* retrieve them.

Of all people, writers know how easy it is to make typing mistakes. And even the most eagle-eyed proofreader misses something now and then. It is easy to be sympathetic with the beleaguered data-entry operator responsible for keying in database information. But that doesn't solve the problem.

The solution is twofold. First, as an information consumer, resist the temptation to put away your natural skepticism and simply accept whatever you download as the final word. It may be impractical to verify everything. But if the information is crucial, spot checks of its validity are definitely in order. If money is involved, as with a potential investment, an even higher degree of vigilance is essential.

Second, use the EXPAND command to check for misspellings. As the example in Table 1 demonstrates, unless the word has been completely murdered, a misspelling should appear alphabetically close on the list to the correct form.

Wild Cards (Truncation)

What personal computer users call "wild cards," the information industry refers to as "truncation." The concepts are identical. For example, when an MS-DOS user wants to copy every file that ends in ".BAS" from the disk in drive A to the disk in drive B, he or she keys in COPY A:*.BAS B:. That tells the computer's operating system that it doesn't matter what's to the left of the dot (period), as long as "BAS" is to its right, and it saves a lot of time, since the alternative would be to laboriously key in a COPY command for every complete filename.

In the online field, the same technique is used both to save time and to allow for possibilities. For example, it would not normally make good sense to search for ROBOT when you know that the records you want *could* contain not only ROBOT but also ROBOTS. To allow for that possibility on DIALOG, you use the question mark as the truncation or wild card character. Keying in ROBOT? will retrieve every record with ROBOT, ROBOTS, ROBOTICS, or any other word with any number of characters after ROBOT.

This is called "right-hand truncation," and there are a number of variations. The search term WOM?N, for example, would retrieve both WOMAN and WOMEN. The search term ROBOT? ? would retrieve words containing only one character after the "stem," so you'd get the singular and the plural but not ROBOTICS. Code numbers can be truncated as well. Searching ABI/INFORM on SELECT CC=53? would hit all records to which the more specific classification codes 5310, 5320, 5330, and so on had been assigned.

Unfortunately, each database has its own truncation character. BRS and Dow Jones use the dollar sign ($), NewsNet uses the asterisk (*), and so on. BRS also offers "left-hand truncation," so you can enter the very heart of a word framed on either side by truncation characters.

Positional or Proximity Operators

On systems like DIALOG, you can also specify where you want one search term to occur in relation to another search term. Do you want "industrial" to appear before and right next to (adjacent to) "robot?"? Is it okay if a certain number of other words are sandwiched in between them? What about having them occur within five words of each other and in any order, ROBOT first and INDUSTRIAL second or vice versa? DIALOG offers you at least seven basic permutations, and other systems do likewise.

In our opinion, these are the kinds of commands you can safely ignore when you are just starting. The only one that's really important is the "W" (with) operator as in INDUSTRIAL(W)ROBOT?. It's nice to know the others are available should you need them, but using them generally takes too much mental energy. In some DIALOG files, you won't even need the "W" operator because you will be able to search by phrase ("industrial robot?") instead of by word.

Boolean Operators and Nesting

If there's one thing database vendor manuals love to go on about it's "logical" or "Boolean" operators (AND, OR, NOT, XOR, etc.). You sometimes get the impression that the authors would be drummed out of the manual-writers union if they didn't include complicated discussions of search logic laced with plenty of Venn diagrams—those intersecting, variously shaded circles you learned about in sophomore geometry. Forget it!

Well, no, don't *forget* it. It's a worthy concept. But don't let it spoil your day. Be aware that you can get so tangled up in Boolean logic and AND/OR/NOT operators that you may never go online. AND means a record must have *both* terms in it. OR means it can have *either* term. NOT means it can*not* have the specified term.

Different people have different philosophies of searching. The simplest and most effective, we feel, is what might be called the bowl-of-fruit approach: apples AND oranges AND grapes AND pears. The idea is to enter a search, note the results, and keep ANDing things to the results until we come up with a manageable number of records we know contain all of our search terms. If you have to think about what your records should NOT contain (NOT lemons NOT bananas NOT mangoes) at the same time, OR what they might *also* contain, things can get rather complicated. Consequently, we suggest that you start with AND and use the other operators only when it is obvious that you need them.

You can also forget about much of the material most manuals contain concerning "nested" search terms like SELECT (SOLAR OR SUN) AND (ENEGY OR HEAT). These things are fine for an information professional, and you may want to use them yourself someday. But for the nonce, put them on "hold." As we'll see in a moment, you can accomplish the same things without all that MENTAL AND (ENERGY OR EFFORT OR WORK).

Online Tip: Most vendors supply quick reference cards or booklets with their documentation. But if you regularly search several systems, keeping all the commands straight can be a real problem. Online, Inc., the publisher of a trade magazine of the same name, has done something about this. It has created The Online International Command Chart.

This is a spiral-bound affair similar in format to a calendar. The leftmost column gives the operation name ("Logon"), and succeeding columns give the required commands for up to 16 different systems. Included are DIALOG, BRS, ORBIT, VU/TEXT, QL Systems, Info-Globe, NEXIS, DATA-STAR, and a variety of European systems. There are 41 commands in all, "from Logon to Logoff."

The cost is $40, but if you order more than one at the same time, each additional copy is $25. Visa, MasterCard, and American Express are accepted. For more information, contact:

Command Chart
Online, Inc.
11 Tannery Lane
Weston, CT 06883
(203) 227-8466

How to Attack a Database Manual

The Eight Crucial Commands

There used to be a reading and study technique taught in elementary schools called S.Q.R.: Survey, Question, Read. The thought was and is that the best way to read a book or a chapter is not to plunge in at page one but to survey the terrain first. Then ask yourself questions about the topic being covered and the coverage itself. Then, and only then, begin reading.

S.Q.R. is an excellent way to attack a database vendor's manual. You've now got the tools and concepts needed to make sense of most of it. All that's lacking is a list of the most important commands. When you strip away all of the advanced commands and fine-tuning features, there are about eight basic things you need to know to use any system.

These are the things you should look for when you are performing S. and Q. and the things you should zero in on when doing R.:

1. How do you get into a particular database or file?
2. DIALOG uses BEGIN followed by the file number. BRKTHRU requires a mnemonic abbreviation like NOOZ for the National Newspaper Index, or lets you choose from a

menu. Dow Jones requires the command //QUOTES for its stock quote database but also offers menus.

3. How do you begin a search?
4. On the Knowledge Index and Wilsonline, you enter FIND. On BRKTHRU and After Dark, you are prompted to "Type in Search Term." On VU/TEXT, you enter S.
5. How do you specify the specific field you want to search?
6. BRS systems use dots after the search term while DIALOG uses field name prefixes or suffixes. In the ABI/INFORM database on BRS, the name of the source publication can be found in the "Source" field (SO), but on DIALOG, the field is called "Journal Name." Thus, these commands are equivalent on the two systems: BUSINESS WEEK.SO and JN=BUSINESS WEEK. VU/TEXT uses an "at sign" @ followed by the field number (found in the documentation for each database) to specify a field. On NEXIS, you can specify the "segment" and use parens: DATELINE (OHIO).
7. What truncation or "wild card" characters are used?
8. VU/TEXT and NewsNet use an asterisk (*). DIALOG uses a question mark (?). BRS and the Dow Jones //TEXT database use a dollar sign ($). Wilsonline uses the hatch mark (#) and the colon (:).
9. How can you search for a phrase of two or more adjacent words?
10. DIALOG uses parentheses and a W (W). ORBIT uses just a matching set of parens with a space in between (). Wilsonline has a special "Stringsearch" command.
11. What tools are available to narrow down the results of a search?
12. This is where the AND operator really comes into its own, for it lets you add more and more stipulations until the specifications become so stringent that only a few records can meet them. Most systems have an AND operator.
13. How do you display results?

On NewsNet, you can look at newsletter headlines or read the whole articles to which they refer. BRKTHRU and After Dark offer short, medium, and long display formats. DIALOG databases may have as many as nine or ten display options.

How do you sign off and stop the connect-time meter from running?

NewsNet's command is OFF. DIALOG's is LOGOFF. Dow Jones requires DISC (for "disconnect"). The quickest way to double the cost of your search is to wait until you're ready to leave a system before you go rooting through the system manual to find out how to get off. Always note the exit before entering the theater.

Free Text Searching

So far, we've concentrated on the idea of specific fields, on the various terms or codes you might look for in those fields, and on the ways you might enter the terms. You should know, however, that you can also do a free text search. Free text searching refers to searching the text of a record without zeroing in on a particular field and without using a controlled vocabulary term. You might think of it as searching paragraphs, whether they are part of the abstract or part of a full-text (complete article) record, using whatever terms occur to you. On the face of it, you'd think this would be the easiest technique of all. Ironically, it is among the most difficult and calls for the most work on your part.

Free text searching can be treacherous. Our language is so rich and so varied that the same word can have many different meanings depending on the context in which it is used. For example, suppose you're after information on job actions and strikes. And suppose you enter SELECT JOB AND ACTION? AND STRIKE?. That tells the system that you want only records containing all three of those terms. Now suppose the database includes a record in which a person is quoted as saying, "We've got a job to do. We must take action now and strike while the iron is hot!"

Your search logic will retrieve that record. Which could be great if the person being quoted was a latter-day John L. Lewis. But suppose it's a newly appointed government official stating his or her views on import quotas, tax reform, or women's rights. Suppose it's the president of a fast-food company talking about taking advantage of a perceived opportunity to beat out the competition.

Surprised? Damn right. But this kind of thing happens all the time when you go online. The industry calls them "false drops," records that were retrieved with legitimate search logic but have nothing to do with what you're after. We like the term "search surprise" because in truth, you never know what you're going to pull up out of a database. It is simply the nature of the beast and yet one more reason to respect your opponent.

Even the best searchers will generate their share of false drops. In fact if they don't, their search logic is probably too narrowly focused to be as comprehensive as it should be. Or there is something else wrong. Our point is that free text searching is False Drop City. If you wander in unaccompanied by a field search or without a highly specific free text term, it is an automatic signal to all the online gremlins in creation to rain false drops down upon your unsuspecting head.

Properly used, free text searching can be an important retrieval tool. But before you venture forth, give some serious thought to coming up with the most specific, unique, proper name or term that is still relevant to your topic. If possible, use field searches first as preliminary screens to narrow down the number of hits.

How to Search Any Database

Zen and the Art of Information Retrieval

In the following section we're going to put it all together, using the search reproduced in Table 1 as an illustrative example. We will be focusing on DIALOG, and by extension, BRS and ORBIT, the other two classic bibcite and abstract database vendors. However, with appropriate modifications to allow for the differences among systems, the same steps can be used to search any database. The process starts with:

The Five Rules of Search Success

Rule 1: Respect Your Opponent
Rule 2: Define Your Target
Rule 3: Consider the Source: Who Would Know?
Rule 4: Don't Go Online Unless You Have to
Rule 5: Know Your Databases

No problem with Number 1. If you don't have a pretty good idea of what you're up against by now, there's nothing we can do to help you. For target definition, let's assume that you're interested in industrial robots because you're thinking about installing them at your plant. There are lots of things you will eventually need to know about the topic, but right now you don't know enough to know what questions to ask. All you know is that the automotive industry seems to have had some success with robots. That's fine. INDUSTRIAL ROBOTS AND AUTOMOTIVE ASSEMBLY LINES is a good place to start.

Who would know about such a thing? Car companies, of course. And makers of industrial robots. Car companies have large, well-paid public relations and public information staffs. Bet they'd have some information for you. Why not give them a call? You may get bumped around to several offices, but eventually you'll find someone who can help you. When you do, explain what you're interested in, and ask the individual to send you some information.

There's no way to tell what that information will consist of. There might be press releases and photocopies of articles published in various trade magazines. It may be nothing but a corporate annual report. But more than likely there will be something you can use: the names of the companies who make the robots, the names of the people at GM, Ford, or Chrysler who are in charge of robot-related projects, the name of one or more trade journals, and so on. Your next step might be to contact one or more robot manufacturers. (The Thomas Register Online database is designed to provide precisely this kind of information.)

Should you go online? Sure you should. The materials you receive from the firms you've contacted can help you refine your search. But you want to know a lot more about the topic, and a database search is ideal for that kind of application. But which database should you choose?

Before choosing a database, stop for a moment and ask yourself about the *kind* of information you want. Do you want a *Scientific American*-type treatment or the kind of article you'd expect *Business Week* to do?

Whatever you decide, by asking yourself these questions you have automatically made the database selection process ten times easier. We'll assume that you've opted for *Business Week*, at least to start. So the question now is: Which online databases cover *Business Week* and similar publications?

If you're brand new to the field, there's no way for you to know off the top of your head. But there are people you can ask and, as noted previously, directories you can consult. The *Directory of Periodicals Online* is an invaluable resource, for example. The catalogs from the various vendors, and the journals lists from the database producers are also good sources. And of course a reference librarian at your corporate information center, in the MIS department, or at a major library may be the biggest help of all.

Many of these folks have the skills to go online and conduct a search for you. You may want to take advantage of that fact at a later date. But when you're trying to get a handle on a topic, when you're not exactly sure yourself what you're looking for, you need to be able to play interactive "I wonder if . . ." games online. Should you later decide to enlist the skills of a professional, you will then be able to give the individual a much clearer idea of what you want and don't want.

Twelve Steps to Online Information Retrieval

Yes, it's beginning to sound like a crazy Chinese herbalist and sex therapist has gotten loose on these pages. But lists can be wonderful things, and frankly we know of no better way to cut through the fog that surrounds information retrieval. So sit back, sip your Lapsang Souchong, and attend The Twelve Steps.

Step 1. Select your database

We've covered this pretty thoroughly. All that remains to be said is that you may eventually want to search several databases. Be aware, however, that at some point you're going to encounter diminishing returns. As noted in a previous chapter, overlapping coverage is fine, since one IP's abstracts can complement another's. But if you search more than a few databases you can very quickly end up with more information than you can successfully digest and you will have lost much of the benefit of using online systems.

Step 2. Check the documentation

Please, please, please do not omit this step. Discipline yourself to do it every time until you know the database so well you don't have to think about it. Which fields are searchable? Can you search by phrases or must you use words and proximity operators? What kinds of information does each field contain: words, code numbers, dates, controlled vocabulary terms?

Step 3. Meditate

Seriously. You may not be a Ninja warrior preparing for battle, but it's not a bad analog. If you ride in like a cowboy with six guns blazing, firing off search terms as they come into your head, you'll stir up a lot of dust, expend a lot of ammunition, and be presented with a hefty bill but very little relevant information when you're done.

Think about the topic beforehand. Let your mind run free and flow into the subject. What do you know and what can you extrapolate about industrial robots? Aren't they used extensively in Japan? Yes. So some of your hits are going to deal with robots in Japanese factories and warehouses. But isn't there something about American companies counting on robots to help them compete with Japanese firms? Yes. So some of your hits will focus on international competition.

It may be that neither of these topics is of interest to you. Or they may be exactly what you're interested in. Either way, by meditating on the problem first, you will be better prepared when you go online. You might want to be prepared to add the term AND AMERICA? or some other term that would eliminate references to Japan (NOT JAPAN?). Similar types of questions can be asked of the searchable fields. Should you limit the search to a particular range of years? Is there a company name you should definitely include? Are there any code numbers that can make things both easy and precise?

Try to develop a list of search words that come close to defining what you want. Some searchers try to think in terms of synonyms. We prefer an approach that's closer to free association. Ultimately, you'll develop a technique that works best for you.

Think about the source material and types of magazines or whatever you are searching. Then pick the words that you feel could logically be expected to appear in the kind of document you're looking for. The process is similar to writing up a bid specification. The document you want will have this, this, and this. It will be published between these dates. It will deal with such-and-such a topic, and so on.

Of course, if you make the requirements too stringent, you won't get any bidders (hits), and if you make the specs too broad you'll get every Tom, Dick, and Harry and his brother. There is also a very good possibility that the precise document you envision does not exist. But you have to start somewhere and doing things this way is likely to be much more productive than simply lunging into a database with a bunch of search terms in your hand.

Step 4. Select your fields

We can't tell you what fields to search, since they vary so with the database. The author (AU) field may be virtually useless in a database of general-interest magazines, but crucial in a database of book titles. If you use a DUNS number, you obviously don't have to also specify the company's name. As noted, doing a free-text search on the abstract field can be tricky and is best done in conjunction with at least one other field. The documentation is your best guide to selecting the fields most likely to retrieve what you want. We would only add that as a rule, use just three or four fields and choose the ones that let you be as specific as possible without getting zero hits.

Step 5. Write out your first search statement in full

Don't try to keep all of your search terms and search logic in your head. Free yourself of them by putting them on paper. When you are actually online, you'll have many other things to think about, and unless you're awfully quick, you don't want to be thinking about all the various words and commands you could use while the meter's running.

Keep a pad of paper and a pen within easy reach, as well. You will need them.

Step 6. Check the display options and verify how you sign off

The ultimate point of going online is to display the records that your search statements have selected. Make sure you know what formats are available and what pieces of information are included in each format as it applies to the database you're going to search. Again, this is not the kind of thing you want to look into while you are connected and paying for online time. The same thing goes for making sure you know how to sign off.

Step 7. Set your computer to capture incoming information

This is so important that it's worth the emphasis of making it a separate step. Generally, it doesn't pay to keep your printer toggled on during an online session. Printers slow things down and thus eat up connect time. During your search you may want to dump a screen to the printer for easy reference. So leave it on and enabled, but don't toggle the printer echo on from within your communications program.

Floppy disks are cheap and erasable, however, so it definitely makes good sense to capture your entire online session. Open your capture buffer or set your communications program to dump to disk or do whatever else is necessary to put the machine in "record" mode. You can always go back into the file and delete the portions you don't want with a word processor. In addition, a record of a complete online session can be a wonderful self-teaching tool, since you can review it to see where you went wrong, the number of hits on a term that you did not follow up on, etc. If you have a hard disk, tell your system to capture to it, since less time is required to write to a hard disk than to a floppy.

Step 8. Sign on and EXPAND your search terms

At this point, we pick up the example in Table 1. Since we are going to be referring to it quite a bit, you might want to take a moment to peruse the entire search session displayed there to get a preliminary idea of what we'll be discussing. Then start at the top with "BEGIN 15," the command that tells DIALOG you want to start searching File 15 (ABI/INFORM).

Skip over the date, time, and other information, and note the next command: EXPAND AUTOMOB. By entering this command at the DIALOG question mark prompt, we told the system to look for AUTOMOB in the inverted files for the fields in its Basic Index. As the ABI/INFORM Bluesheet points out, these fields include the abstract, the company name, the descriptor, and the article title. There is no way to focus on just the descriptor or just the abstract field with INFORM. Note that there are 1,669 hits on AUTOMOBILE INDUSTRY, the term that is closest to what we were after. The same term could have been found in the controlled vocabulary list in the *SearchINFORM* manual.

We made a note that that was the proper term to use and then moved on to the actual search logic.

Step 9. Enter your first search statement and note the results

For the purpose of this demonstration, we decided to focus only on *Business Week* and only on issues published between 1984 and 1986. Thus we entered SELECT SETS JN = BUSINESS WEEK AND PY = 1984:1986. Notice that in response to the SELECT SETS command, the system assigns a set number to each element in the statement. Reviewing the results, we find that there are 9,659 records with BUSINESS WEEK in the journal field (JN), 91,110 records for articles published between our specified years, and 2,217 records where these two fields intersect.

That's a good first cut and it means that we are now dealing with a limited universe of 2,217 articles instead of the more than 320,000 that are in the ABI/INFORM database.

Step 10. Add qualifiers to narrow the search

Some searchers like to put all of the qualifiers they can think of in their initial search statements. Many of the commands that clutter the vendor system manuals are designed to make this possible. For our money, this makes things needlessly complex and eliminates much of the interaction that is the essence of the "I wonder if . . ." approach.

We prefer to think of searching as a process similar to repairing a household appliance at a well-equipped workbench. There are certain tools (search terms and search logic) you know you're going to need to open the case or remove the housing. But from then on there are no definitive steps to follow. At this point, we've got the case off and are peering into the machine's innards to try to get an idea of the situation.

Now it's time to reach for a tool that looks like it might do the trick. Let's cull out all the records in our set of 2,217 that refer to articles dealing with the automobile industry. Using the abbreviation for SELECT SETS (SS), this time we apply the ABI/INFORM authorized descriptor AUTOMOBILE INDUSTRY. As noted earlier, specifying the descriptor field requires use of the /DE suffix. Note that instead of rekeying all of the search terms in set three, we merely used its number (S3).

Now what have we got? Set 5 (S5) with 72 hits. That still sounds like a lot, but we know from experience that that's not bad. After all, we're not finished yet.

Hoping for Bingo we took our newly reduced set of 72 records and told the system to search it for occurrences of INDUSTRIAL(W)ROBOT?. Since we did not specify any field for this new term, the system automatically searched every field in the Basic Index. This was, in effect, a free text search, since INFORM abstracts are often short articles in themselves.

Look at the results. There are 150 abstracts in the database in which the term INDUSTRIAL(W)ROBOT? appears in the Basic Index. But there are none with all the terms we have specified. Was a search term misspelled? Should we sign off, review the session, and sign back on again with new terms and refined logic? What went wrong?

Nothing really. Since we've always heard the machines referred to as "industrial robots," we simply assumed that that was the term to use. Obviously it wasn't. It was the wrong tool for this particular job.

"I wonder if . . ." a broader term like ROBOT or ROBOTS would do the trick. Sure enough, telling the system to check our 72-item set (S5) for that word yielded three hits (S11). We're almost home.

Step 11. Display results

This is the easy part. There's nothing like conducting a search that appears to be on the beam and yields a manageable number of results. Here you have merely to key in TYPE 11/5/1 to display the first record in Set 11 using Format 5. That is the full-record format for many DIALOG databases.

Except in full-text databases like Magazine ASAP where the full-record format costs $7 and involves downloading the complete article, we prefer to always look at the full record when displaying results. It's a bit more expensive (the one shown here costs 50¢), but it can save a lot of time and possibly money as well. If you look at a more limited format and decide that on that basis you want to see the full record, you'll pay for the display of the same information twice.

Besides, by reviewing all of the fields in a record you can often discover search terms and concepts you hadn't thought of. Although we were aware of GM's new Saturn operation, for example,

Table 2. A Complete ABI/INFORM Search on DIALOG

```
?BEGIN 15
    DDMMMYY 11:53:03 User 000000
  $0.00   0.002 Hrs File 1

File 15:ABI/Inform - 71-8N/MMM, Week 3
(Copr. Data Courier Inc. 19—)

    Set  Items  Description

?EXPAND AUTOMOB

Ref  Items  Index-term
E1       1  AUTOMIZATION
E2       1  AUTOMIZED
E3       0  *AUTOMOB
E4       1  AUTOMOBIEL
E5    4353  AUTOMOBILE
E6     135  AUTOMOBILE DEALERS
E7     145  AUTOMOBILE FLEETS
E8    1669  AUTOMOBILE INDUSTRY
E9     446  AUTOMOBILE INSURANCE
E10    113  AUTOMOBILE LEASING
E11   1708  AUTOMOBILES
E12      1  AUTOMOBILEWORKERS

        Enter P or E for more
?
?SELECT SETS JN=BUSINESS WEEK AND PY=1984:1986

  S1    9659   JN=BUSINESS WEEK
  S2   91110   PY=1984:1986
  S3    2217   JN=BUSINESS WEEK AND PY=1984:1986

?SS S3 AND AUTOMOBILE INDUSTRY/DE

        2217   S3
  S4    1669   AUTOMOBILE INDUSTRY/DE
  S5      72   S3 AND AUTOMOBILE INDUSTRY/DE

?SS SF AND INDUSTRIAL(W)ROBOT?
          72   S5
  S6   18832   INDUSTRIAL
  S7    1254   ROBOT?
  S8     150   INDUSTRIAL(W)ROBOT?
  S9       0   S5 AND INDUSTRIAL(W)ROBOT?
```

```
?SS S5 AND ROBOT?

          72   S5
  S10   1254   ROBOT?
  S11      3   S5 AND ROBOT?

?TYPE 11/5/1

 11/5/1
85005280
  How GM's Saturn Could Run Rings Around Old-Style
    Carmakers

  Whiteside, David; Brandt, Richard; Schiller, Zachary;
    Gabor, A.

  Business Week n2878 (Industrial/Technology Edition)
    PP.126,128

  Jan 28, 1985

  CODEN: BUWEA3
  ISSN: 007-7135
  JRNL CODE: BWE
  DOC TYPE: Journal paper
  LANGUAGE: English   LENGTH: 2 PAGES
  AVAILABILITY: ABI/INFORM

 Just as Ford Motor Co.'s assembly line became the mainstay
of industry in the US, General Motors Corp.'s new Saturn Corp.
subsidiary may pave the way for the elusive "factory of the fu-
ture." GM's Saturn subsidiary is a $5-billion bid to try to revolu-
tionize automobile manufacturing. The details have not been
finalized, but GM is attempting to assemble the most advanced
manufacturing technology possible. By replacing the assembly
line with a fully computerized production system that extends
from the dealer to the factory floor, GM is hoping that it can
close the estimated $2,000-per-unit gap between its production
costs and those of Japanese competitors. Saturn would
change nearly every aspect of automaking operations. It is ex-
pected to tie together GM's collection of advanced technology
in robots, machine vision, and computers, which the company
has assembled over the past few years. Saturn's objective is to
reduce costs on all fronts. The system will bring component
production and assembly together on one site.

    DESCRIPTORS: Automobile industry; Case studies;
      General Motors-Detroit; Subsidiaries; Automated; Pro-
      duction; Systems

    CLASSIFICATION CODES: 5240 (CN=Software & sys-
      tems); 5310 (CN=Production planning & control); 8680
      (CN=Transportation equipment industry); 9110
      (CN=Company specific)
```

we had never thought about it in terms of industrial robots. Perhaps by incorporating SATURN in a search statement you would discover a whole range of information about the latest robot technology. "I wonder if . . ."

Step 12. Log off and write your capture buffer to disk.

You already know about logging off and stopping the clock. The only point to be added is that you shouldn't hesitate to log off and log on frequently in the course of a search. There is no minimum charge or other cost penalty each time you logon. With DIALOG and most other databases, you pay only for your actual connect and telecommunications time. It is thus much better to log off and review the results at leisure than to try to play "Beat the Clock" while you are online.

Closing a capture buffer and writing it to disk or otherwise making an orderly exit from your online session is something that's easy for a new communicator to forget to do. Because of the way most personal computers do things, if you neglect this step, you may lose all of the material you have downloaded, and the information that has already been written to disk may be rendered inaccessible.

Conclusion

Although we have reproduced only one of the three records retrieved, all were typical of what one could expect from a broad search of this type. It is not the ultimate article on industrial robots in the automotive industry. But it's a good lead to additional information. The abstract also gives you enough information to decide whether you want to order a photocopy of the original article, look for it in your company files, or pass it by.

Certainly there is a lot more searching to be done. But as you search, you remember that the definitive article as you envision it may not exist. With all the information that's out there it may seem like a paradox that no one has written the one article that can fill all of your needs. But it is really yet one more confirmation of that fifth force of nature, "the information force." There are so many variables and so many possible configurations. If you're looking for statistics, market share, names and addresses, corporate earnings, or any other specific, narrowly defined fact, it's a different story. You can find all of these things with relative ease.

But when you are looking for general information on a subject, you will get a different type of result. If the "perfect" article exists, there's a good chance that you'll find it online. But it is more likely that you will pull the information you need out of a collection of documents and thus create your own "perfect" article.

Finally, it's important to point out once again that there is no one correct way to search. Someone else might have done things in a different order and used a completely different approach than that illustrated in Table 1, though the results would have been essentially the same. As you become more familiar with the online world, you'll develop your own style.

Ultimately, no one can teach you how to search. We can describe the databases, show you the tools, and suggest ways to use them. But to really learn, you have to go online. And as with any other skill, to become proficient you have to practice. ■

Communicating by Macintosh

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Anatomy of a Macintosh Telecommunications Program .... -107

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This report will help you to:

- Communicate among Macintosh and MS-DOS computers.
- Link a Macintosh with modems and other communicating equipment.
- Acquire Macintosh telecommunications programs.
- Determine the future of Macintosh communications.

Hundreds of thousands of Macintosh computers are being sold each year worldwide, and it's very likely that you're going to need to telecommunicate to or from a Mac someday—if you haven't already. More often than not, this will happen at the worst possible moment, and if you're unprepared, it could be a grueling experience. The information in this report will give you all the background you need to accomplish communication to or from a Macintosh with minimum frustration, and will also introduce you to the Mac's unique communication features.

Why Use a Macintosh for Telecommunication?

When the Mac was first released, there was a dearth of useful software for it, and the first telecommunications programs were primitive compared with what was available in the MS-DOS market. Thankfully, this is no longer true. There are now a number of exceptionally good telecommunication programs available for the Mac within a wide price range, and it is not difficult to find a package that is as good, if not better than its MS-DOS counterparts. We'll look at the major players in detail a bit later.

The best reasons to use a Macintosh to communicate are the same ones that make this a unique machine to begin with. There have been reams written on this subject, so I

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won't attempt to rehash The Macintosh Way of Life, but here are some of my own favorite reasons.

Consistency of Operation between Applications: From the first day the Macintosh was on the market, Apple released to software developers a set of Human Interface Guidelines that would help provide consistency between all Mac application programs. This is not to say that all Mac programs look alike and operate with the same commands, but the user interaction components are similar from program to program. A lot of what you learn from your first Mac program will be useful in other applications. If you've ever been saddled with a new computer and a half dozen user manuals each as thick as your arm, you'll appreciate that the Macintosh (with well-written Mac software, of course) lets you get to work much sooner.

Built-In Communications between Programs: The Macintosh allows data to be moved from one program to another with very little fuss. Typically, you select the data you wish to move, use a single menu command (the same command for every Macintosh application) to copy this data to a holding area called the Clipboard, and then choose a second menu command to "paste" this data from the Clipboard to the second program. In practice, this is even easier than it sounds. For instance, it's a simple task to copy a large table of numbers from a word processing document and paste it into a spreadsheet program for calculations or analysis.

Graphic Display: The radical design of the Macintosh system software has resulted in the most eye-pleasing display of any personal computer. Beyond its aesthetic charms, the Mac's display lends itself greatly to an interface based on visual symbols, rather than memorized commands. To widen a spreadsheet column, for example, you might simply move the mouse to "grab" the edge of the column and pull it to the right or left as desired. The author uses word processing software that displays each page symbolically as a piece of paper, and it looks exactly as it will when it is printed out. The intuitive nature of well-designed Mac software means you'll be spending less time digging through user manuals for a forgotten sequence of cryptic commands.

Macintosh Communications Software Standards

There are two major differences between communicating with a Macintosh and communicating with other brands of personal computers: file compression and file format.

File Compression

File compression is used widely by Mac telecommunicators to reduce the size of a file, so that the time needed to transmit the file is equally reduced. Upon reception, the compressed file is then decompressed to its original size and content. Compression is also used to join several files into one long file, which reduces the amount of human interaction necessary to transfer the group. Upon reception, the member files are then extracted from the group file.

Just as in the MS-DOS industry, the Macintosh industry has moved through a number of file compression standards. Each compression program was judged widely on its ease of use, as well as the relative merits of its compression algorithms. One program, StuffIt, has clearly risen above the rest, and is now used by nearly all Macintosh telecommunicators. All the major commercial networks have accepted this standard for files uploaded to their libraries. StuffIt has emerged as the compression program of choice, and is highly recommended to you if you intend to use your Mac for telecommunications with other Mac owners. Your local Macintosh user's group, bulletin board system, commercial network, or computer dealer can provide an evaluation copy (shareware). Or you can purchase a copy directly by sending a check for $22 (U.S. funds) to Raymond Lau, 100-04 70 Ave., Forest Hills, NY 11375-5133.

Files compressed using StuffIt are by convention given a filename that ends in .SIT. Therefore, if you see a file titled Graphics.SIT, you will know this file has been compressed using StuffIt, and that you will have to decompress the file using StuffIt after downloading, before the file can be used. Since this file-naming convention is used by the majority of Mac telecommunicators, it is strongly suggested that you adhere to it when uploading files to a public network, to avoid confusing those who later download the files. A public domain version of StuffIt that will do only decompression, called UnStuffIt, is widely available through the aforementioned sources.

In addition to file compression/decompression, StuffIt can also be used for password-protected file encryption, so that only authorized parties can decompress and use a file. The program can also compress several files into one large compressed file; each of the files can then be extracted and decompressed automatically upon reception.

File Format

One of the more marked differences between Macintosh files and files on other personal computer brands is the file storage format. Files on other personal computers typically have their data stored in one long contiguous stream. In contrast, a Macintosh file may consist of two different areas of storage called the *Data Fork* and the *Resource Fork*. One or both of these forks may be present in a single Macintosh file, and when either is present, it is a necessary element of the file.

The contents of the Data Fork are nonspecific. Software developers are free to use for any purpose the Data Fork of a file created by their product. The Resource Fork, however, is more closely controlled. The Resource Fork may be compared to a database file, in that it is composed of grouped records, called *resources*. There are literally hundreds of different kinds of resources; common ones are executable software code segments, icons, bit-mapped pictures, and the contents of a program's pull-down menus.

Each resource is given a type designator, to identify what kind of resource it is, and an identification number, to give it a unique specifier among like resource types. Thus software developers who want a program to display a predetermined picture on the screen can write a very simple piece of code that instructs the Mac system software, for example, to "Load the resource containing picture #128." The Mac software then extracts that resource from the Resource Fork and presents it to the program, which in turn displays the picture. This concept is radically different from anything found on other personal computer brands, and is extremely efficient. It is one of the major factors behind the Mac's success.

A third storage area holds a group of data called the *Finder Information Block*. This data tells the *Finder* (the Macintosh's built-in disk operating system) what sort of icon will represent the file, how to react when a user tells the Macintosh to open that file, and other facts about the file.

Because there is no such thing on non-Macintosh computers as a Data Fork, Resource Fork, or Finder Information Block, it was necessary for Macintosh telecommunications software authors to establish a way to move all the information about a Mac file as a contiguous block of data. This would allow the file to reside on non-Macintosh computer systems, and then be automatically recognized and reconverted back to the original three file elements upon reception by a Macintosh. In 1985, a group of telecommunications software authors created what would become known as the MacBinary Format, and all the current Macintosh telecommunications programs use and recognize this standard.

The beauty of the MacBinary Format is its transparency to the user. The Macintosh telecommunications program knows when this format must be used and automatically invokes it. Likewise, the software recognizes when data being received is in MacBinary Format, and automatically does the necessary conversion back to the file's original form and content. Because this conversion is done before the data is actually sent, and again after the data has been received, the MacBinary Format is compatible and will not interfere with any of the file transfer protocols implemented widely on personal computers, including Xmodem, Ymodem, and Zmodem.

A minor revision was made to the MacBinary Format in 1987 to account for some additional information Apple added to the Finder Information Block, and to provide additional protection against a file being incorrectly identified as MacBinary Format. This revision is called MacBinary 2, and has been implemented by most of the major telecommunications programs. The revision is upwardly compatible with the original MacBinary, which means that if a file is uploaded in MacBinary 2 Format, it can still be downloaded by a telecommunications program that only recognizes the original MacBinary Format.

One side effect of the MacBinary Format is that the Finder Information Block contains the original name of the file. The receiving Mac program will always attempt to use that original name. Therefore, don't be surprised if you download a file listed as GRAPH.SIT on a network and it shows up on your disk with the name GRAPHICS PICTURE.SIT.

Most telecommunications programs allow MacBinary Format use and recognition to be turned on or off. The rule of thumb here is to know what sort of file you are receiving. If the file was originally created on a Macintosh, the MacBinary Format must be turned on. If it was created on a machine other than a Macintosh, the MacBinary Format must be disabled.

Macintosh Communications Hardware Standards

The Macintosh is equipped with two built-in serial ports, labeled Modem Port and Printer Port. Although either port can be used for telecommunications, Apple's local area network hardware (AppleTalk) is tied to the Printer Port. Therefore, always use the Modem Port for telecommunications whenever possible.

According to Apple, the serial ports are configured to both RS-232 and RS-422 standards. In truth, they are not full implementations of either standard, but they can be used to get at least a primitive compatibility with either standard. RS-422 is a high-speed, externally clocked standard: On the Macintosh, RS-422 has seen limited use by the AppleTalk hardware and some laboratory data acquisition equipment. For telecommunications, only the RS-232 standard aspect of the serial ports is used.

Actually, to refer to the Macintosh serial ports as RS-232 ports is stretching the point. This is because Apple chose to implement only the minimum number of signals necessary to make a connection with most RS-232 equipped machines. On the original 128K Macintosh, this meant a ground signal, transmit and receive signals, and one input handshake line. Beginning with the Mac Plus, an additional output handshake signal was added, along with rudimentary software support for hardware (CTS/RTS) handshaking.

It should be noted that the Serial Controller Chip (SCC) in the Macintosh does provide support for the entire RS-232 standard, and there's a reason why Apple originally used only a few of the available signals. The company reasonably assumed (in 1984) that there would be little need for the full complement of RS-232 signals. To save production costs, the unused data lines were employed to control the mouse (an admirable hardware hack in itself). Why this questionable arrangement has endured all the way to Mac's top-of-the-line, multimegabuck models is anyone's guess.

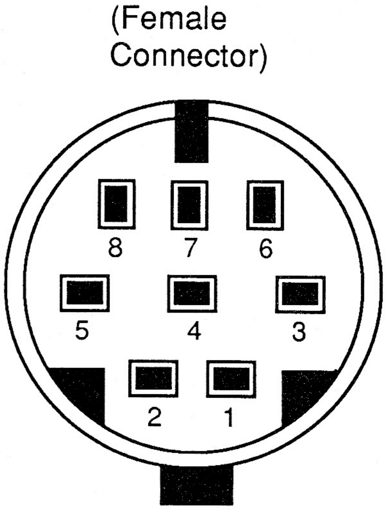
The proliferation of reasonably priced high-speed modems in the last year or so has revealed this lack of full implementation to be an Achilles' heel. It's simply impossible to monitor the status of the Carrier Detect signal, or properly use the Data Terminal Ready signal, while supporting hardware handshaking. Since most of the current batch of high-speed modems prefer, and some even demand, hardware handshaking between the Mac and the modem, the Mac telecommunications authors may continually find themselves in a position to compromise the quality of their software when working with these state-of-the-art modems.

To make matters worse, there has been no standardization between the dozens of modem cable manufacturers concerning the ground transmit and receive signals. As far as the input and output handshake lines are concerned, it's potluck as to where the manufacturers decide to connect them, if they connect them at all. It's strongly recommended that you buy your modem cable from the same company that manufactures your modem, to avoid potential problems. Macintosh serial port pinouts are shown in Figures 1 and 2.

Transferring Text Files to and from a Macintosh

The Macintosh, like all other personal computers, uses the 7-bit ASCII (American Standard Code for Information Interchange) standard as its native character set. However, because the Macintosh uses software (rather than hardware) character generation for on-screen display, a programmer can invent a custom font that deviates completely from the ASCII standard. It is a relatively simple matter, for example, to rearrange the transmitted characters to support IBM's EBCDIC (Extended Binary Coded Decimal) standard, or to write a font that supports non-English alphabets. Because the 7-bit ASCII standard defines characters only for codes 0 through 127, the codes 128 through 255 are not standardized. In fact, they can (and almost certainly will) vary—not only from personal computer brand to brand, but even among the different fonts

Figure 1.
Macintosh Serial Port Pinouts: DIN-8 (Mac Plus and later)



1 - Output Handshake
2 - Input Handshake
3 - RS-232 Transmit data
4 - Ground
5 - RS-232 Receive data
6,7,8 - Not used for RS-232

installed on a single Macintosh. Again, it would not be difficult to program a font that mimics the IBM-PC or Commodore 64 character sets.

Note: As of this writing, only one Macintosh telecommunications program, Red Ryder, allows the use of any font installed in the Macintosh to be used for displaying received data. Other programs ignore system-installed fonts and defer to only those provided in the program itself.

Another problem with file transfer occurs when the connection between computers must be made with less than eight data bits. In this case, it is mechanically impossible to transmit the ASCII codes 128-255. Even with an 8-bit connection, some telecommunications programs automatically strip out the highest order bit of each received byte, which converts characters in the 128-255 range to bogus characters.

Although it would be ideal to have completely equivalent character sets between machines that exchange textual data, the lack of support for diverse fonts will most likely not be a problem for most Macintosh users. You'll need to acquaint yourself with the characters defined in the 7-bit ASCII standard character set, and restrict your use of characters with codes in the 128-255 range. The characters in the 7-bit ASCII standard should prove adequate for all but the most specialized needs.

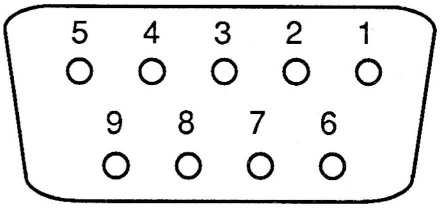
If you do need to use characters 128-255, there is a simple way to get this across to the destination machine. Simply, define a unique sequence of 7-bit ASCII standard characters for each special character, and then use a word processor's find-and-replace-character feature to replace all occurrences of the special character with the defined sequence. Once the document has been transmitted, the receiver can then use a word processor to find and replace all occurrences of the defined sequence with the special character (or something as close to it as possible).

Typically, these measures will only be needed when transmitting between a Macintosh and a non-Macintosh computer. It's best to avoid any character set conflicts by sticking to the 7-bit ASCII standard.

Control Characters

When it comes to control characters (ASCII codes 0 through 31), use of the ASCII standard becomes quite inconsistent among personal computer brands. Some word processors assign a meaning to almost all the control characters, while others support only a minimal subset. The word processors currently in wide use on the Macintosh all have private data file formats, and use the 7-bit ASCII standard only for importing and exporting files to other word processors. The control characters not

Figure 2.
Macintosh Serial Port Pinouts: DB-9 (Mac 128K, 512K, and 512KE)



1,3 - Ground
5 - RS-232 Transmit Data
7 - Input Handshake
9 - RS-232 Receive Data
Other pins not used for RS-232

recognized by the Macintosh are almost always displayed as rectangles.

Let's examine each of the control characters recognized and used by Macintosh word processing programs.

Line Feeds and Carriage Returns

Perhaps one of the most aggravating aspects of trading files between Macintosh and non-Macintosh machines is the treatment of line feed (ASCII code 10) and carriage return (ASCII code 13) characters. The Macintosh convention is that a carriage return character implies both a carriage return (move cursor to leftmost column) and a line feed (move cursor down one line). Unfortunately, you'll find that a large number of non-Macintosh computers (including the PC-DOS/MS-DOS machines) require *both* carriage return (CR) and line feed (LF) characters to accomplish this function. If a file with only carriage returns is transferred to a machine that requires CR/LF pairs, the word processor may die when it attempts to load that file, or the file may be displayed in some bizarre manner.

When importing files that contain CR/LF pairs to a Macintosh word processor, the Mac software will almost certainly display the LFs as garbage characters at the beginning of each line. Luckily, most of the popular Macintosh telecommunications programs have features to add LFs after CRs in outgoing text files, and to strip LFs after CRs in incoming text files. However, if your telecommunications software lacks these features, there are at least two public domain desk accessories, DeskZap and McSink, and one commercial utility program, Vantage, that perform these tasks after a file has been received, or before it is sent.

A second CR/LF conflict you're likely to run into concerns the placement of CRs. The Macintosh convention is to treat a paragraph of text as one long line of data, and to place a single CR at the end of the paragraph. The prevailing PC-DOS/MS-DOS standard is to place a CR/LF pair at the end of every line in a paragraph. For files outgoing from a Macintosh, this is only a minor problem, since all the current word processors can be instructed to place the CR (often referred to as a line break) at the end of each line in the paragraph. Additionally, several Mac telecommunications programs can word-wrap outgoing files so that these line breaks are automatically added at the proper column number as the file is being sent.

The placement problem may be more severe when importing text files to a Macintosh. Unless the CRs are removed from the end of each line, the paragraphs will not reformat properly when the margin settings are changed. Red Ryder contains a feature to automatically convert an incoming text file to "paragraph" format, but if you are using another Macintosh telecommunications program, you'll have to delete the line breaks inside a paragraph yourself.

Tabs

The Macintosh does not recognize or use vertical tabs (ASCII code 11). Horizontal tabs (ASCII code 9) are supported, but there are some problems inherent with their use. For tabbed (columnar) data to line up properly, it's important that the tab stops be set at precisely the same locations on the machine that creates the document as the one that will receive it. If this is not easily accomplished, use a group of spaces, rather than a tab, to separate your columns.

Form Feeds

Most of the Macintosh word processors ignore or improperly display the form feed character (ASCII code 12), and use multiple carriage returns to simulate this character when saving files for export. Most of the non-Macintosh word processors use the form feed character to cause a page break. There's no easy solution to this, except to compare the number of lines each machine prints on a page of paper, and use multiple carriage returns in the transmitted file to make sure the pages line up properly. Otherwise, you'll need to manually clean up the page divisions on the receiving machine.

Character Width Conflicts

Another problem crops up when the character width is different on the sending machine than the receiving machine. If a document is prepared with a monospaced font (each character in the 7-bit ASCII standard is of equal width) and then sent to a machine which is using a proportionally spaced font (each character may have a width different from others), the document will not display as intended.

Experts suggest, when you're preparing a file for transmission from a Macintosh to a non-Macintosh, that you use a Monaco 9-point font, and set the margins so that the 81st character on a

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line drops down to the next line. This has proven to be the most reliable solution.

For importing a file from a non-Macintosh computer, set the same margin positions, and then convert the entire document to Monaco 9-point. On most Macintosh word processors. this is easily accomplished. Position the mouse to the left of the first character in the document, and click. Then move the mouse to the right of the last character in the document. Hold down the SHIFT key, and click the mouse again. This selects the entire document, so that global font selection and point sizing can be performed.

The Lazy Way to Get It Right the First Time

What you've read in the preceding sections might seem to be an inordinate amount of gymnastics necessary to import and export files between a Macintosh and a non-Macintosh. Your fears are somewhat justified: The truth is that it can be more difficult than you'd like to get a file into shape on the receiving end. If you find yourself frequently communicating with a machine that requires a lot of adjustments to accomplish a file transfer, you might want to consider shopping for a Macintosh telecommunications program that will do most of the dirty work for you.

However, there is a significant ray of hope for those transferring word processing documents between Macintosh and PC-DOS/MS-DOS machines. Microsoft Word, WordPerfect, and PageMaker (among others) all have versions for both the IBM side and the Macintosh side. Each of these programs saves a document in a special format for exporting to the complementary machine's version. Even graphics embedded in the text can be easily transferred, and none of the import fiddling is necessary. If you can swing it, this technique is highly recommended.

Caution: Remember to *turn off* the telecommunication software's MacBinary Format option before transferring a file in either direction between a Macintosh and PC-DOS/MS-DOS machine.

Anatomy of a Macintosh Telecommunications Program

This report's resident expert in Mac telecommunications programs is Scott Watson, author of Red Ryder, one of the more popular programs, so you'll now get a guided tour of his product. In the process, you'll see how Macintosh telecommunications products differ from those on other computer brands.

Depending on your needs, Red Ryder may or may not be the best choice for you. If you're planning to purchase a Macintosh telecommunications product, it's important to research *all* the following widely used products:

- MicroPhone II, from Software Ventures Corporation, 2907 Claremont Ave., Berkeley, CA 94705. Suggested retail price $295
- Smartcomm II, from Hayes Microcomputer Co., 5923 Peachtree Industrial Blvd., Norcross, GA 30092. Suggested retail price $149
- MacTerminal, from Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014. Suggested retail price $125
- VersaTerm-Pro, from Peripherals, Computers, and Supplies, 2457 Perkiomen Ave., Mount Penn, PA 19606. Suggested retail $295
- Red Ryder, from FreeSoft Company, 150 Hickory Drive, Beaver Falls, PA 15010. Suggested retail $129

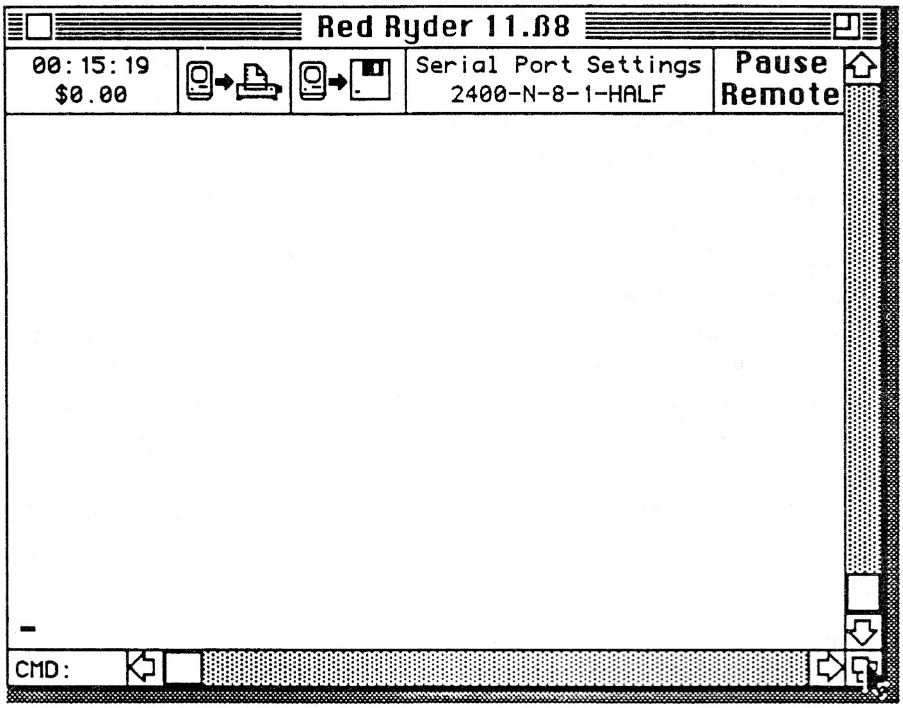
The Terminal Window

When Red Ryder is executed, the program first loads all your settings from the last session. Then it displays the *Terminal Window*, shown in Figure 3.

At the top of the window, from left to right, are a number of controls that continually display information or perform a task. Leftmost is the elapsed time clock and billing clock, which tells you at a glance how long you've been on line, and how much you've spent on long distance charges and/or network connection time charges. Next are two buttons for saving received information; the first one sends the current screen of data to the printer, and the second sends it to a disk file. To the right of these buttons is the current serial port settings display. Clicking the mouse in this box allows you to quickly change the baud rate, parity, data-bits, stop-bits, and duplex settings. Clicking in the last box in this row tells the remote machine to stop sending; clicking again instructs the remote machine to resume sending.

Note that the size of the Terminal Window can be enlarged or reduced to whatever size is convenient to you. The horizontal scroll bar at the bottom lets you look at data that is past the right edge

Figure 3.
The Terminal Window



00:15:19
$0.00

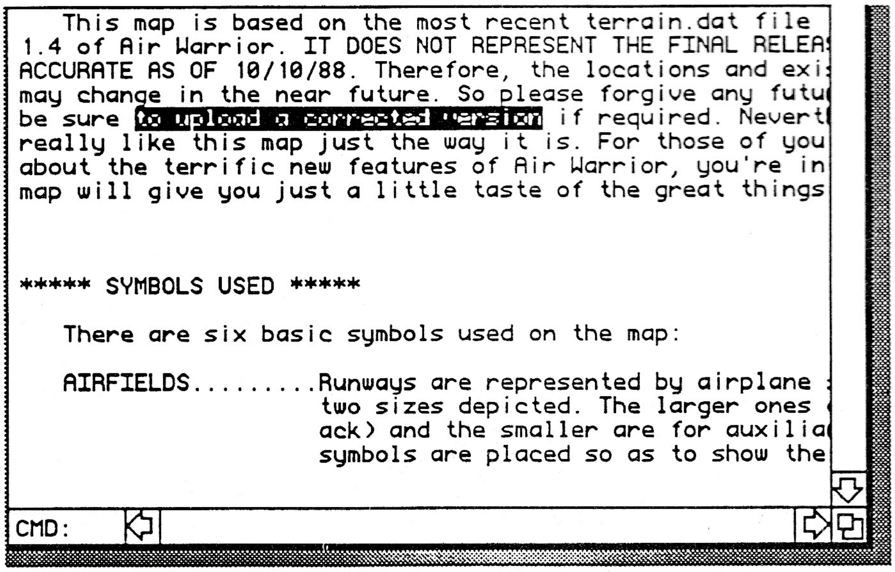
Serial Port Settings
2400-N-8-1-HALF

of the window. The vertical scroll bar lets you look at data that has scrolled off the top of the window.

Received text appears in the center of the Terminal Window, as in Figure 4. It's easy to work with the data in this area. To select text, merely position the mouse cursor over the text, and then hold down the mouse button while dragging the mouse over the desired text. The selected text is displayed as white characters on a black background. Once text is selected, you can send it to the printer; or create a new file on the disk and save the information in that file; or append the selected text to the end of an existing file. You can also copy the selected text to the Macintosh Clipboard so that it can be pasted into a different program.

The appearance of incoming data in the Terminal Window is controlled by an interesting gizmo called a *filter* (Figure 5). There are three separate filters in Red Ryder. One filter controls how received text is displayed in the Terminal Window; a second determines how incoming text is saved in a captured file (to be explained later); and a third

Figure 4.
Received Text



```
   This map is based on the most recent terrain.dat file
1.4 of Air Warrior. IT DOES NOT REPRESENT THE FINAL RELEA
ACCURATE AS OF 10/10/88. Therefore, the locations and exi
may change in the near future. So please forgive any futu
be sure to upload a corrected version if required. Nevert
really like this map just the way it is. For those of you
about the terrific new features of Air Warrior, you're in
map will give you just a little taste of the great things


***** SYMBOLS USED *****

   There are six basic symbols used on the map:

   AIRFIELDS.........Runways are represented by airplane
                     two sizes depicted. The larger ones
                     ack) and the smaller are for auxilia
                     symbols are placed so as to show the
```

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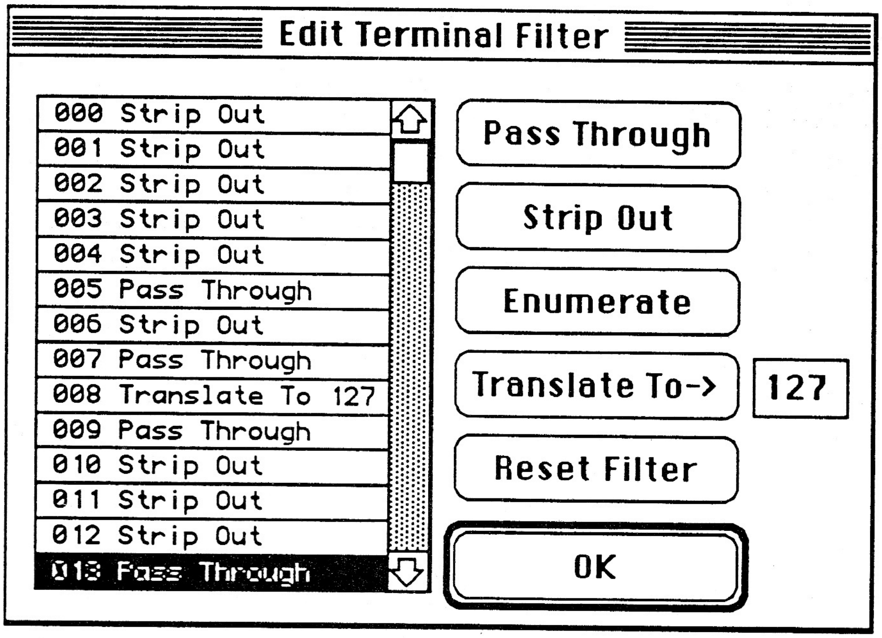

000 Strip Out
001 Strip Out
002 Strip Out
003 Strip Out
004 Strip Out
005 Pass Through
006 Strip Out
007 Pass Through
008 Translate To 127
009 Pass Through
010 Strip Out
011 Strip Out
012 Strip Out
013 Pass Through

Figure 5.
Edit Terminal Filter

filter determines how characters are saved that have been received as part of a protocol file transfer.

For each of the 256 ASCII character code values, you can specify that it should be passed through, stripped out, translated to some other ASCII code, or enumerated to show the ASCII code itself rather than the actual character represented by that code (for example: <008>). Filters make it easy to deal with unwanted or awkward characters originating from non-Macintosh systems.

The received text in the Terminal Window can be displayed using any font and any point size installed on the Macintosh. If you are using a Macintosh that supports Color Quickdraw, you can specify the colors for the foreground, background, and highlighting from a palette of 248 possible colors.

The Terminal Window supports TTY, VT52, VT100, and VT102 terminal emulation. Incoming text can be easily routed to the printer.

Sending Text Files

Red Ryder lets you send a text file without a file transfer protocol, as a byte-by-byte dump over the serial port. You can also specify that the file is to be sent a line at a time, each line to be sent after receipt of a prompt character from the remote system. You can also select an amount of time to delay after each line or character has been sent. If your word processor saves text files with a carriage return only at the end of each paragraph, you can tell Red Ryder to automatically word-wrap the transmitted lines at a certain column, so that words are not broken in the middle.

Capturing Incoming Data

Red Ryder can be instructed to route all incoming text to a disk file until further instructions. You can even temporarily halt and resume capturing without closing and reopening the file. Through the File Capture Filter, you have complete control over which characters are saved in the disk file, and which ones are stripped out, translated to other characters, or enumerated.

Red Ryder also contains a facility for printing out a captured (or any other text) file. All Apple-approved printers are supported, including AppleTalk printers like the LaserWriter. Printed documents can be in any font and any point size installed on the Macintosh. Red Ryder will also number and time/date stamp each page.

Protocol File Transfers

Red Ryder supports a wide variety of the most commonly used file transfer protocols. Since Red Ryder supports desk accessories and can operate in the background under Apple's MultiFinder operating system, you can use the Mac for another task while a file transfer takes place.

The protocols supported are:

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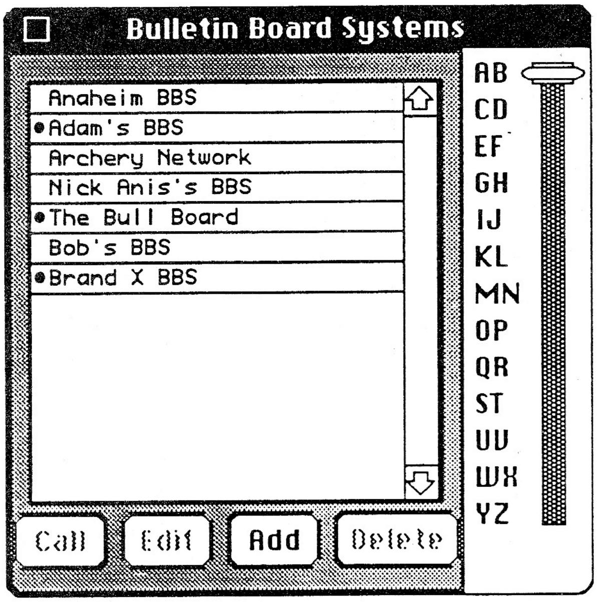
Figure 6.
The Phone Book



Bulletin Board Systems

Anaheim BBS
●Adam's BBS
Archery Network
Nick Anis's BBS
●The Bull Board
Bob's BBS
●Brand X BBS

- Xmodem - Checksum
- Xmodem - CRC
- Xmodem - 1K blocks
- Xmodem - Supercharged receive (preacknowledged blocks)
- Ymodem
- Ymodem - 1K blocks
- Ymodem - G
- Zmodem (with later resumption of interrupted file transfers)
- Kermit
- Long Packet Kermit
- Sliding Windows Kermit
- Flash Protocol

The Flash Protocol is a proprietary (nonstandard) protocol used for highest efficiency file transfers between two Red Ryders connected with error-correcting modems.

Modem Handling

Red Ryder has a number of built-in routines for handling Hayes-compatible modems. This means the user should never have to know the rather obscure commands used by the modem. There are routines for dialing, automatically redialing a busy number, initializing the modem, turning on or off the modem's auto-answer incoming call feature, or disconnecting a connected modem. Red Ryder also supports a special kind of script file (discussed later in this chapter) called a Modem Driver, which allows the program to automatically control a semi- or non-Hayes-compatible modem, or to implement up to ten user-defined commands to take advantage of brand-specific modem features.

Phone Book

Another convenient Red Ryder feature is the Phone Book. You can create as many different Phone Books as you wish, each one with or without password protection. The Phone Book (Figure 6) looks much like its real-life cousin found on most desktops.

To connect to a system that has been added to the Phone Book, simply position the mouse over the desired name, click the mouse button, and then click inside the "Call" box. Red Ryder then changes any settings (such as baud rate) necessary for that system, dials the system, and can even execute an auto-logon sequence after a connection is made.

An interesting feature called *gang dialing* is sure to be appreciated by those who frequently call several busy bulletin board systems. In the above Phone Book illustration, the system names marked with a black dot have been specified as members of the gang. When you tell Red Ryder to gang dial the Phone Book, it will attempt to connect with each member of the gang, in round-robin fashion, until a connection is made.

Macro Keys

Red Ryder has 30 Macro Keys that you can define. These keys are displayed as either three sets of ten push-buttons at the top of the Terminal Window, or in a special Macros Window. In the Macros Window, each key can be displayed as a push-button, an icon, a color icon, a double-sized icon, a double-sized color icon, or a picture. The items in this window can be arranged as you wish, and there are script commands for making each individual item visible or invisible in both the Terminal Window and Macros Window displays. This lets you construct your own graphic interface.

By clicking the mouse on any item, the associated Macro Key is executed. A Macro Key can perform one of these user-selected functions: send a preprogrammed string of up to 240 characters; execute a script file; or load a set of Macro Keys previously saved as a disk file.

Script Files

The workhorse of an advanced telecommunications program is its automated programming language, often referred to as a *scripting language.* Red Ryder's scripting language consists of over 200 commands, and it sports a built-in, two-pass compiler, to produce scripts that execute extremely fast. Red Ryder calls these Procedures.

The commands compiled into a Procedure are submitted to the compiler as a text file, as in native software development environments such as Pascal or C. For beginners, Red Ryder provides a point-and-click environment to make the construction of Procedures easy. In Figure 7, the lines containing the Procedure commands are shown at the top; at the bottom is the point-and-click area, which guides the user through plain-English prompts to arrive at a desired command.

Red Ryder's Procedure language includes full support for numeric and string variables. There are many commands for character input/output processing and user interface presentation. Red Ryder's scripting language can also link transparently to external code written by the user in such languages as Pascal or C, to provide unlimited future expansion.

Keyboard Support

You can instruct Red Ryder to supply line feeds after carriage returns when the ENTER key is pressed. The keyboard can also be mapped to support the execution of Macro Keys with a designated key or combination of keys. Additional support is provided for remapping the keyboard to utilize the VT100/VT102 numeric keypad, function keys, and cursor keys.

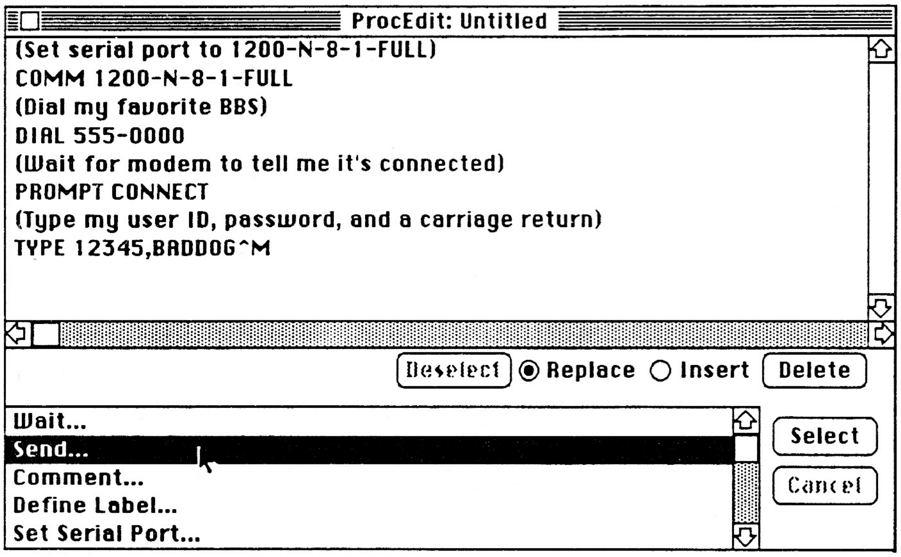
The Future of Macintosh Communications

When Apple released the Macintosh in 1984, the machine was completely isolated from all other computer brands. There were no suitable telecommunications programs available for it. For awhile, it appeared that because of the Mac's unique disk size and format, there would be no way for it to exchange data with any other machine except another Macintosh. In just a few short years, this situation has changed dramatically.

One does not need a crystal ball to see that the Macintosh's future in telecommunications is bright. There are an enormous number of developers working feverishly to expand the Macintosh's communications capabilities, and Apple has committed an exceptional amount of resources and support to assure that this happens.

Future Hardware

A full range of "connectivity" hardware has been announced by Apple, and other developers are working on similar products. Macintosh will soon have the same ability as MS-DOS machines have to connect with mainframes and minicomputers.



```
(Set serial port to 1200-N-8-1-FULL)
COMM 1200-N-8-1-FULL
(Dial my favorite BBS)
DIAL 555-0000
(Wait for modem to tell me it's connected)
PROMPT CONNECT
(Type my user ID, password, and a carriage return)
TYPE 12345,BADDOG^M
```

Figure 7.
Sample Procedure Commands

Also, the built-in limitation of only two serial ports should be eliminated after the release of System Software Version 7. This version will contain a Communications Toolbox, which will allow drop-in circuit boards containing additional serial ports. At least one manufacturer is already producing such boards, but it's impossible to write software to take advantage of these additional ports without an Apple standard.

As high-speed modems become more common, Apple will have to address the limited number of RS-232 handshaking lines available. The solution to this problem will probably require a radical engineering redesign, and will probably not be tackled until the users demand it.

You can also expect to see facsimile modems come down in price and become commonplace peripherals in Macintosh setups. There are already quite a few existing (and planned) facsimile modems that also contain an on-board Hayes-compatible modem, which offers the best of both worlds to the Macintosh owner.

Future Software

When a Macintosh telecommunications program emulates a DEC VT100 terminal, the effect on Mac's hardware is akin to a lobotomy. Suddenly, you lose nearly all the advantages the Macintosh offers, and are returned to the old world of memorized command sequences and an unintuitive interface. However, the Mac telecommunications program must provide this support, because the DEC VT100 "lowest common denominator" terminal offers a wide range of connectivity possibilities.

What Macintosh users are waiting for is efficient telecommunication without losing the Macintosh interface, and software authors have taken great strides in providing a glimpse of the future in this regard. Two commercial networks currently support a Macintosh interface—AppleLink and MacNet. Although different in appearance, both operate in a similar and intuitive manner that makes it easy for a first-timer to perform complicated tasks. Both suffer from a bit of sluggishness, but that seems to be a design or mechanical flaw, rather than one of concept. You can look for these operating glitches to be removed in future implementations.

Apple has even provided a new program and protocol, MacWorkStation, that allows in-house developers to write mainframe software that presents a Macintosh interface to the user on the mainframe.

Unfortunately, these Mac interface systems limit the kinds of machines that can connect to the network. AppleLink, for example, can only be called by Macintosh computers using the specially designed AppleLink software. What is clearly needed is a standardized protocol that can take advantage of whatever benefits the host and client machines offer, without being brand specific—much like the X Windows protocol has done for the UNIX environment. Commercial network services tend to innovate more slowly than personal computer software authors, but nearly all of the major services have shown interest in this particular improvement.

A second way telecommunications can be made friendlier for Macintosh users is for the telecommunications program to do some intelligent conversion of both incoming and outgoing data. If the network to which you are connected operates in a predictable manner, the telecommunications program can offer an environment that is much more Macintosh-like.

For example, if the network sends out a menu of commands and asks for a selection, the Macintosh telecommunications program might intercept this menu, recognize it, and present a Macintosh-style window containing icons or pictures representing the commands. When you click the mouse over one of the pictures, the telecommunications program intercepts this action and sends the proper data to the network to select that command.

This sort of "intercept and convert" operation is becoming very popular with Macintosh owners. It can be in the form of a network-specific telecommunications program, like CompuServe's Navigator, or it can be offered by a general-use telecommunications program as a sophisticated programming language. Both Red Ryder and MicroPhone II contain numerous commands in their scripting languages to accomplish this conversion process, and additional improvements are underway.

However, this I/O conversion operation has its drawbacks. Because there can be a tremendous amount of redundant information, an "intercept and convert" script may run faster than the network, and performance tends to suffer compared to what could be done with a protocol written specifically to support such an interface. Second, these scripts can be extremely complicated, and in many cases can only be written by experienced programmers and telecommunications specialists. Until we do have the Ultimate Portable Telecommunications Environment Protocol, most future innovations will probably come from "intercept and convert" scripting capabilities.

Future Communications Protocols

In the past, communications protocols have not been limited to any specific brand of computer, but a machine's particular architecture can limit how quickly a protocol is implemented. For instance, the Zmodem protocol was widely available on MS-DOS machines due to their relatively simple file structure. However, only with the most recent crop of Macintosh telecommunications programs has the Zmodem protocol been implemented on Macs. This is due to the difficulty of working with the MacBinary Format in conjunction with this protocol.

One of the more interesting new developments has been multichannel protocols. Although several have been proposed, few have worked well in practice. Scott Watson's program, Okyto, allows you to send and receive a file simultaneously, as well as carry on a typed conversation with the remote party while the file transfers take place. All of this is done with only a tiny amount of efficiency loss, as compared to a single-direction file transfer protocol like Xmodem.

Mac users are also clamoring for on-the-fly data compression/decompression schemes that are independent of machine and file transfer protocols. The current batch of algorithms (Huffman, Lempel-Ziv, to name a few) used for this task consume too much processor time to operate along with a file transfer protocol, without severely degrading the file transfer. Hopefully, a new compression/decompression scheme will emerge that offers acceptable compression ratios, or perhaps faster CPUs will allow the current schemes to operate within acceptable limits. It will certainly be to everyone's mutual benefit if the authors of these packages can agree upon a machine-independent standard, much as the Macintosh telecommunications authors did for the MacBinary Format standard.

In the long run, although the Mac will always be in a world slightly different from that of the PC, these differences need not be obstacles. ■

Using On-line Databases for Current Awareness

End users are increasingly joining information professionals on-line.As a way of staying abreast of trends and developments in their fields. We estimate more than 100 current awareness databases (those that producers update on a short-term, regular basis) now exist.

This report describes three types of current awareness databases—realtime, research/archive, and specialty. NewsNet, NewsGrid, McGraw-Hill's SNAPSHOT Service, and DIALOG Information Services are among the services and producers covered. The report also provides pointers for searching current awareness databases.

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STATE OF THE ART

In his book, *Odyssey*, Apple chief executive John Scully observes that "the computer is more than a tool, it is a medium" that, by the 21st Century "will change the way we look at the world." He predicts "a renaissance sparked by a new information class," saying he hopes that technology will "be the source for new tools for creating a new world."

From an on-line information perspective, it appears we are well on our way to Scully's dream. Among the notable trends in the on-line information industry are increased user awareness; better, reasonably priced delivery systems; lower cost; more variety; and shorter update cycles. Taken together, these factors are spurring a trend toward using on-line data resources for more of our current information. It holds true in businesses and institutions across a broad range of disciplines.

Established on-line information vendors are rapidly adding new databases and services. Individual companies are leveraging their internal information resources, making them available to a broader range of in-house users. Other database producers are offering nonsensitive data to on-line providers, such as DIALOG or VU/TEXT, for broader dissemination.

Even more interesting is the information seekers' increased awareness of the availability of on-line data. Fewer than three years ago, we found most on-line users were information professionals. They were public, institutional, and company librarians; research assistants; and database professionals. They worked for large companies or institutions and spent most of their working time finding and supplying information to other people who used it.

Today, suppliers' records show more of the actual users of on-line information access databases themselves. DIALOG, for example, reports an increase of more than 35 percent in the number of information users who access data on-line. The number of information professionals, however, has not declined. DIALOG reports professional researchers "who search all day," still use most of its on-line time, so the base of on-line users is growing and changing simultaneously.

A noteworthy aspect of the current on-line market: users seem less sensitive to on-line charges. "They want that information," is how a DIALOG spokesperson put it. But, during our discussions about on-line access with many corporate users, we learned that part of the reason for this change is a better understanding and acceptance of on-line price structures. Businesses accustomed to paying quarterly or annual charges for information resources often balk at $1.00-to-$5.00 per-minute levies. It is easy to imagine annual billings that are thousands of dollars over budget. The reality is that, properly managed, on-line searching is considerably more economical than conventional methods.

The composition of on-line information also is changing. We see a greater variety of data from a broader range of sources, and more of it is in full-text form. Whereas traditional informational databases have been fielded reference services or compilations of short abstracts, better delivery systems and information-hungry users are fueling a move to full text. On DIALOG alone, for example, users access over 450 full-text periodicals.

Data delivery systems and the tools available to end users for searching databases and manipulating found information are getting better and cheaper. High-volume magnetic storage is now priced so that virtually any user of PC-based workstations can afford more storage than many mainframes had just a few years ago. The workstations themselves cost less. They have also increased performance, so it's no wonder they are replacing dumb terminals.

Whereas 300 bps communications was the norm in recent memory, some of today's on-line searchers find 2400 bps

▷

This Datapro report was developed by Tom Badgett. Mr. Badgett has covered the computer industry as a free-lance writer for more than 12 years. His current areas of specialty are on-line databases, database management software, and communications.

Using On-line Databases for Current Awareness

limiting. Modems capable of 9600 bps and higher rates are readily available, and prices are coming in line with other computer tools.

Responding to user needs, on-line providers are supplying communications software with friendly front ends. This software is optimized for on-line searching, and it often contains dedicated features for specific services. Also, third-party suppliers, such as Personal Bibliographic Software, Inc., provide software to help with logon, searching, and downloading of on-line data. In addition, software is available to build local databases from selected data and report on it in bibliographic, abstract, or text formats.

Other reports in this publication cover these and related topics. See, for example, "Using On-line Databases for Competitive Analysis" (Page OL10-400-101); "An Overview of Front-Ends, Gateways, and Other Search Aids" (Page OL70-600-101); and "All About Microcomputers" (Page OL70-700-101).

Current Event Awareness

Technology affects virtually every business today, from changing the office tools we use, to communications and transportation, to financial procedures and competitive analysis. With these technologies comes more information about them, and through these technologies comes more information about the businesses that support and benefit them. For executives, particularly, simply staying abreast of industry-specific trends is difficult enough; to also remain on top of global political and financial trends adds a sometimes unreasonable load.

The growth in electronic data storage and retrieval to service our current awareness needs is helping to ease the problem.

CURRENT AWARENESS DATABASES

Whether any of the more than 4,000 available on-line databases can be categorized as a current awareness vehicle is purely a matter of personal interpretation. The issue of what is "current" depends a great deal on the nature of your business. For example, researchers and educators need to stay up to date with advancements and trends in their areas of concentration; however, detailed monthly or quarterly journals can probably satisfy most of their information needs. Stock traders and financial speculators, on the other hand, may find the 90-second delay for posting information on Dow Jones' News/Retrieval service too long to wait.

For this discussion we consider databases updated on a relatively short-term, regular basis as current awareness offerings. We emphasize those that vendors market specifically for that purpose, but the user can interpret the concepts and methods to any on-line service.

An Overview of What's Available

Although some on-line databases are difficult to categorize, others fall squarely in the current awareness category. They provide information from monthly and weekly magazines and newspapers; and they offer data from daily newspapers and wire services; they make available the contents of both well-known and obscure newsletters and journals from nearly every discipline.

As Table 1 shows, a wide variety of information is available. This list is a very small sample. For example, there are at least 75 current awareness databases available from DIALOG alone. Some of them, and additional services not carried by DIALOG, are available from other sources such as Dow Jones, CompuServe, The Source, NewsNet, VU/TEXT, and Western Union.

Any discussion of on-line databases blurs the boundaries between the actual databases and the companies that provide them. NewsNet is a good example. Besides wire services and other sources, this aggressive realtime information provider carries about 350 newsletters, some of which are available from no other source. It is much easier to talk about searching NewsNet than to say "I'm going to look at AP Newswire, Kyodo News Service, and the *Mobile Phone News.*"

Like NewsNet, which specializes in newsletters, most services have unique information sources. Also, some databases, such as *AP Newswire* and the *Official Airline Guide*, appear on multiple services.

The next part of this report provides details on a sampling of these services. It introduces the range of services available, describes differences among access methods, and suggests some techniques to get you started in on-line current awareness searching.

Remember that these companies are carriers of information, which they collect from a variety of sources, including individual publications and comprehensive databases. The services each provider offers are similar, and they exhibit some continuity across the available information sources. Yet each provider has its own policy about frequency of updates, searchable information, billing structure, and so forth.

Types of Current Awareness Databases

Within this umbrella of services exist three basic types of current awareness databases: realtime, research/archive, and specialty.

Realtime databases provide short-term updates, usually hours or days. The most responsive services offer almost instantaneous updates. Vendors sometimes characterize these as "continuous update" services, which means that data is placed on-line as soon as it becomes available. Included in this category are Dow Jones/News Retrieval, which can update some of its databases within 90 seconds, *McGraw-Hill News*, NewsNet, NEXIS, and *PR Newswire.* Other databases are updated within hours instead of minutes. Except for the exceptional demands of the financial world, the timeliness of updates represents realtime in the

Using On-line Databases for Current Awareness

CURRENT AWARENESS DATABASES

Database	Producer	Focus
American Baptist News Service	NewsNet, Inc.	Full-text from *The American Baptist Journal* and other church-related sources. Weekly updates.
AMA/NET	American Medical Computing Ltd.	Bibliographic and abstract information from medical field sources. Daily updates.
American Banker	American Banker	Full-text articles from the *American Banker* financial newspaper. Updated daily.
AP News	Associated Press	Full-text of AP newswire. Uploaded to database within 48 hours to AP subscribers.
Business Dateline	UMI/Data Courier	Full-text from about 140 regional business publications. More than 30,000 articles from 1985 on. Updated weekly.
Businesswire	Businesswire	Full-text of news releases from business, industrial, and educational institutions. Updated daily with about 100 new records.
College Press Service	Interrobang, Inc.	Full-text college news for students, administrators, and faculty. Updated weekly.
Computer Library	Information Access	Abstracts and full-text from more than 135 magazines and journals. CD-ROM delivery. Each disk contains the most recent year of information. Updated monthly.
Dow Jones/News Retrieval	Dow Jones/News Retrieval	News and market information from *the Wall Street Journal* and Dow Jones. More than 40 databases. Bibliographic and abstract information from general news, financial, sports, weather, and other sources. Updated continuously.
Executive One	McGraw-Hill	Full-text, abstracts, and analysis of business news from many printed and electronic sources. Delivered via FM broadcast subcarrier. Updated continuously.
Facts on File	Facts on File, Inc.	Full-text news articles from selected U.S. newspapers.
McGraw-Hill News	McGraw-Hill Information Network	Current business news from around the world. Updated every 15 minutes.
NewsBASE	Datapro Research	Diskette-based abstracts from published sources. Sold with database search and retrieval front end.
NewsNet	NewsNet, Inc.	Full-text news and analysis from newsletters and wire services. Coverage from more than 350 newsletters in addition to traditional news sources.
News-a-tron	News-a-tron Corp.	Full-text, original news and feature material specializing in financial topics. Updated daily.
News Online	Standard & Poors	Database and summary corporate information and financial data. Updated daily.
NewsGrid	Comtex Scientific Corporation	Full-text news and business news. Separate financial section. Updated about every two minutes.
News Service	Legi-Slate, Inc.	Full-text of *The Electronic Washington Post* plus such government resources as the *Congressional Quarterly*. Updated daily.
Newsearch	Information Access	Abstracts from a wide range of periodicals and indexes. Full-text from the PR Newswire. Updated daily.
Newsline	Information Access	Bibliographic and full-text from newspapers. National and international political, business, and financial information. Updated daily.
NEXIS	Mead Data Central	Full-text from about 160 newspapers and magazines. Complete text is searchable. Updated continuously.
PR Newswire	PR Newswire Assoc.	Full-text news releases from about 12,000 organizations. Updated continuously.
The Online Chronicle	Online, Inc.	Expanded version of the news pages from *Online* and *Database* magazines. Also offers a Jobline for listings of positions sought and offered. Updated biweekly.
USA Today Decisionline	Gannett New Media	Summaries of major news topics from *USA Today* and the Gannett National Information Network. About 2,000 records covering most recent two weeks. Updated daily.

Table 1 Representative current awareness databases. Most of these databases are available from DIALOG, CompuServe, and NewsNet. See the Information Retrieval Services (OL20) and Database Profiles (OL40) sections of this publication for additional details on these databases.

news business. Among providers with updates from a few hours to a few days are *American Banker*, AP Newswire, Businesswire, and *USA Today* Decisionline.

Research/Archive services carry older information—a few weeks to a few months. The information is not old in the sense that it is outdated. Some of the sources for this information publish only monthly or less often. For many applications, month-old information is quite useful. Although some of the realtime services keep only a few weeks' worth of information, the research/archive providers often have several years of on-line history, sometimes from hundreds of publications. *NewsBase*, *The Online Chronicle*, and *Computer Library* are in this category.

Specialty databases offer highly specific information with a narrow focus and probably a limited audience. Sometimes vendors offer these newsletters, journals, and papers alone; sometimes they are part of a much larger offering, such as the one on NewsNet. Offerings from DIALOG, NewsNet, and ORBIT Search Service are in this category.

On-Line Databases—A Sampling

We have chosen a representative sampling of services and databases to provide the flavor of this growing and useful field. For information on constructing on-line searches, see "How to Look it Up Online" (Report OL10-200-101), elsewhere in this publication.

NEWSNET

In the realtime arena, NewsNet is one of the premier services. Its on-line offerings cover a spectrum of disciplines that are useful to almost any current awareness searcher. Although NewsNet's user interface is not "friendly" by modern workstation software standards, it is easy to learn.

When you sign on to NewsNet, it presents a banner of new services and announcements that it regularly updates. Then you get a terse command line:

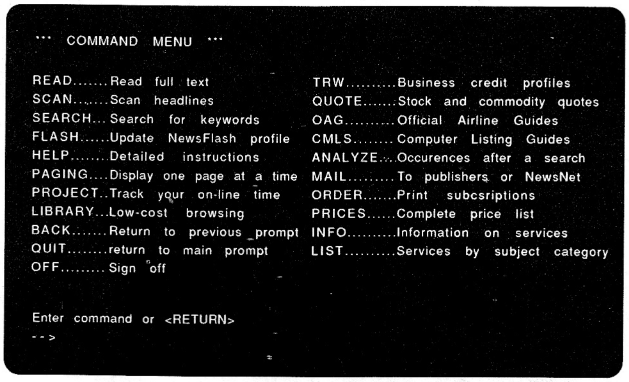
```
Enter command or <RETURN>

-->
```

When you press RETURN a command menu is displayed. (See Figure 1.)

NewsNet offers a good combination of command and menu structures. Actually, it is a command-driven service, and the menu-like structure is part of the help facility. To execute any of the listed menu items, you must enter the command on the command line.

NewsNet is designed for the lowest level dumb terminal that may sign on. That can make the constant screen rewrites and scrolling tedious for PC users, but all the information is there.



```
*** COMMAND MENU ***

READ.......Read full text              TRW..........Business credit profiles
SCAN.......Scan headlines              QUOTE.......Stock and commodity quotes
SEARCH...Search for keywords           OAG..........Official Airline Guides
FLASH......Update NewsFlash profile    CMLS........Computer Listing Guides
HELP........Detailed instructions      ANALYZE....Occurences after a search
PAGING....Display one page at a time   MAIL.........To publishers or NewsNet
PROJECT..Track your on-line time       ORDER.......Print subcsriptions
LIBRARY...Low-cost browsing            PRICES......Complete price list
BACK.......Return to previous prompt   INFO.........Information on services
QUIT........return to main prompt      LIST..........Services by subject category
OFF.........Sign off


Enter command or <RETURN>
-->
```

Figure 1. NewsNet's command menu

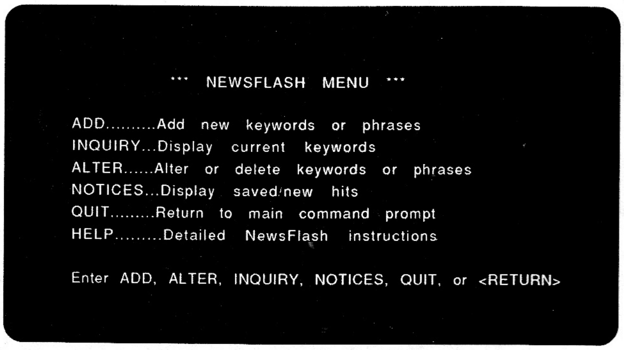
You can display the command menu at any prompt by pressing Return, or you can display help on specific topics with the Help <topic> command. The BACK command moves to the previous operation, and you can abort a procedure at any time with the QUIT command.

Two interesting NewsNet features will appeal to beginning users as well as seasoned searchers. The *Library* facility lets you browse selected publications for content, style, and usefulness at a reduced rate. The Library area contains a single sample copy of many of the carried publications for your inspection.

The *NewsFlash* service helps you select subject areas and specific topics for automatic searching, whether you are logged onto the service or not. When you ask for NewsFlash from the command line, NewsNet presents the menu shown in Figure 2.

From here you can specify industry codes to narrow the search to general subject areas (see Figure 3). Then you can exclude from the search up to four specific newsletters, to eliminate multiple hits from a source you can't use. Finally, you enter the words or phrases you want NewsFlash to use in its regular scan of the databases.

Your NewsFlash profile becomes effective at the next midnight and continues until you turn it off. While this feature is useful and it saves time, be aware that NewsNet charges you $0.50 for each record NewsFlash finds for you, whether you ever read it or can use it when you do



```
*** NEWSFLASH MENU ***

ADD..........Add new keywords or phrases
INQUIRY...Display current keywords
ALTER......Alter or delete keywords or phrases
NOTICES...Display saved/new hits
QUIT.........Return to main command prompt
HELP.........Detailed NewsFlash instructions

Enter ADD, ALTER, INQUIRY, NOTICES, QUIT, or <RETURN>
```

Figure 2. The menu from Newsflash, a current awareness service available through NewsNet.

read it. A little practice with the on-line searching, however, quickly shows you how to narrow the search to the topics you really need to find.

When you log on to NewsNet, a message alerts you to captured NewsFlash data. You can then scan the headlines or read the entire abstract or article.

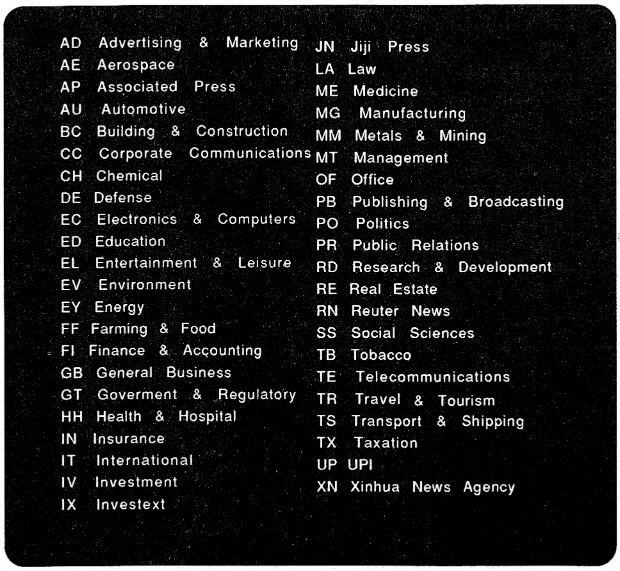
COMPUSERVE

CompuServe is also a popular on-line service, although many users probably don't think of it as a news service. Over the past few years, CompuServe has greatly increased its range of news- and current awareness-oriented offerings.

CompuServe uses a hybrid navigational structure that allows you to use command-line instructions or select what you want from on-screen menus. When you type GO NEWS at the main menu at logon, CompuServe presents the News/Weather/Sports menu shown in Figure 4.

There is the *AP Newswire*, for example, with portions updated every hour. CompuServe also offers the *Executive News Service (ENS)*, an electronic clipping service from the AP wire that works like NewsNet's NewsFlash. When you log on to the ENS and specify keywords or phrases of interest, AP stories that fit the model are flagged and collected for you to read next time you log on to CompuServe. The only user requirement for ENS is that you sign up for the Executive CompuServe service. This user option provides several cost savings and benefits, as long as you can commit to at least $10 per month in on-line usage with CompuServe.

McGraw-Hill also offers CompuServe subscribers SNAPSHOT: hourly news that includes information from Standard & Poor's 500, the Dow Jones Industrial Average, New York Stock Exchange Composite Volume, and the NASDAQ Composite. You also can view the top five business headlines hourly. Figure 5 shows a sample SNAPSHOT report.



AD	Advertising & Marketing
AE	Aerospace
AP	Associated Press
AU	Automotive
BC	Building & Construction
CC	Corporate Communications
CH	Chemical
DE	Defense
EC	Electronics & Computers
ED	Education
EL	Entertainment & Leisure
EV	Environment
EY	Energy
FF	Farming & Food
FI	Finance & Accounting
GB	General Business
GT	Goverment & Regulatory
HH	Health & Hospital
IN	Insurance
IT	International
IV	Investment
IX	Investext
JN	Jiji Press
LA	Law
ME	Medicine
MG	Manufacturing
MM	Metals & Mining
MT	Management
OF	Office
PB	Publishing & Broadcasting
PO	Politics
PR	Public Relations
RD	Research & Development
RE	Real Estate
RN	Reuter News
SS	Social Sciences
TB	Tobacco
TE	Telecommunications
TR	Travel & Tourism
TS	Transport & Shipping
TX	Taxation
UP	UPI
XN	Xinhua News Agency

Figure 3. Industry codes used by NewsNet.

NewsGrid, another news service, retains CompuServe's menu/command structure. It also uses industry keywords to narrow searches for specific topics. This is a newswire service that compiles information from the Associated Press, United Press International, Kyodo, and others. Its menus step you through several current awareness topics, as Figure 6 shows.

NewsGrid's industry codes are similar to NewsNet's. As with NewsNet, specifying codes before you enter your actual search criteria can reduce the amount of information that must be scanned, reducing your search time and on-line charges. (See Figure 7 and compare with Figure 3, the NewsNet codes.)

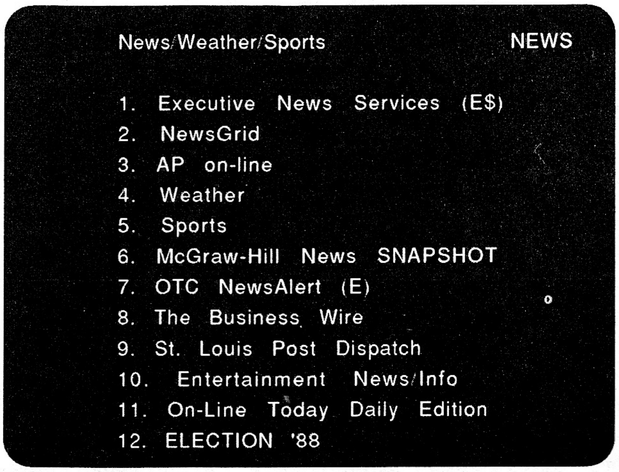
A NewsGrid scanning feature (see Figure 8) displays current headlines with numbers beside them. You can read the full story by selecting the appropriate number. The NewsGrid record contains keywords, such as proper names, company names, countries, and industries, and you can construct a search of the database by keyword.

DIALOG

DIALOG Information Services provides about 320 databases covering a broad range of disciplines. Of these, the company identifies at least 75 as current awareness databases.

DIALOG's experience is a good indication of the growth rate of on-line information. The company says its data banks are increasing at the rate of about 8 gigabytes per month, or about 266 megabytes every day.

Like NewsNet, DIALOG offers cross-database searching through its Dialindex feature, an on-line database of on-line databases. After Dialindex gives you a list of the

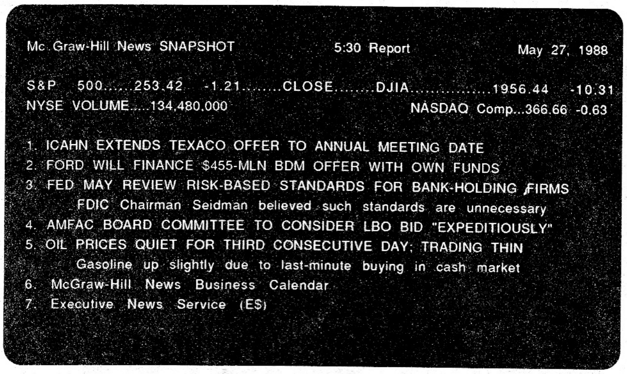


```
News/Weather/Sports                    NEWS

1.  Executive News Services (E$)
2.  NewsGrid
3.  AP on-line
4.  Weather
5.  Sports
6.  McGraw-Hill News SNAPSHOT
7.  OTC NewsAlert (E)
8.  The Business Wire
9.  St. Louis Post Dispatch
10.  Entertainment News/Info
11.  On-Line Today Daily Edition
12.  ELECTION '88
```

Figure 4. News services available on CompuServe. Several of these, including NewsGrid and McGraw-Hill News SNAPSHOT, are current awareness services.

Using On-line Databases for Current Awareness



```
Mc Graw-Hill News SNAPSHOT              5:30 Report              May 27, 1988

S&P  500......253.42  -1.21.......CLOSE.......DJIA..............1956.44  -10.31
NYSE VOLUME.....134,480,000                            NASDAQ Comp...366.66 -0.63

1. ICAHN EXTENDS TEXACO OFFER TO ANNUAL MEETING DATE
2. FORD WILL FINANCE $455-MLN BDM OFFER WITH OWN FUNDS
3. FED MAY REVIEW RISK-BASED STANDARDS FOR BANK-HOLDING ,FIRMS
        FDIC Chairman Seidman believed such standards are unnecessary
4. AMFAC BOARD COMMITTEE TO CONSIDER LBO BID "EXPEDITIOUSLY"
5. OIL PRICES QUIET FOR THIRD CONSECUTIVE DAY; TRADING THIN
        Gasoline up slightly due to last-minute buying in cash market
6.  McGraw-Hill News Business Calendar
7.  Executive News Service (E$)
```

Figure 5. The menu that appears when a CompuServe user selects the McGraw-Hill News SNAPSHOT database. Notice it gives the user a quick read on the current business news.

databases that relate to a general topic, you can ask for a search across all or some of them.

After the initial sign-on banner, DIALOG presents a prompt line where you enter your instructions. By typing "Begin 411" you can enter the Dialindex segment. Figure 9 shows the results of searching "Newspap," the Dialindex acronym for the newspaper category. You can search other categories from Agriculture to Social Science.

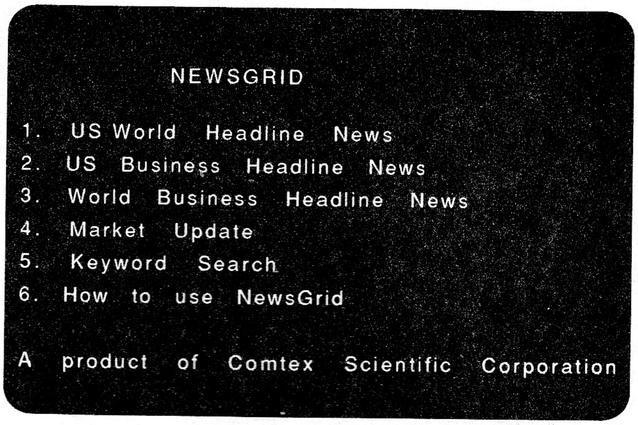
Features such as Dialindex, which appear in an increasing number of on-line services, not only help you locate databases to search, they conduct a preliminary scan of the files to determine where the majority of hits will be. This reduces random file searching, which saves you on-line time and money.

GETTING STARTED

There may be as many as 100 current awareness databases, even if your definition is narrow. How, then, do you decide which ones to use?

Go through Vendors. The easiest answer is to subscribe to one of the database services that provide access to a variety of databases. It doesn't make much sense to subscribe to one database directly if, for about the same charge, you can subscribe to a service that carries that database and many others.

Identify Your Information Needs. Garrison Keillor, host of the successful "Prairie Home Companion" public radio broadcast, used to say "I just start talking until I think of something to say." Too many beginning on-line searchers do the same. They dial the service and browse through its features and databases without enough direction. Then they complain, "I couldn't find anything worthwhile and it cost too much."



```
                NEWSGRID

1.  US World  Headline  News
2.  US  Business  Headline  News
3.  World  Business  Headline  News
4.  Market  Update
5.  Keyword  Search
6.  How  to  use  NewsGrid

A  product  of  Comtex  Scientific  Corporation
```

Figure 6. The main menu from NewsGrid, a current awareness service available on CompuServe and other on-line services.

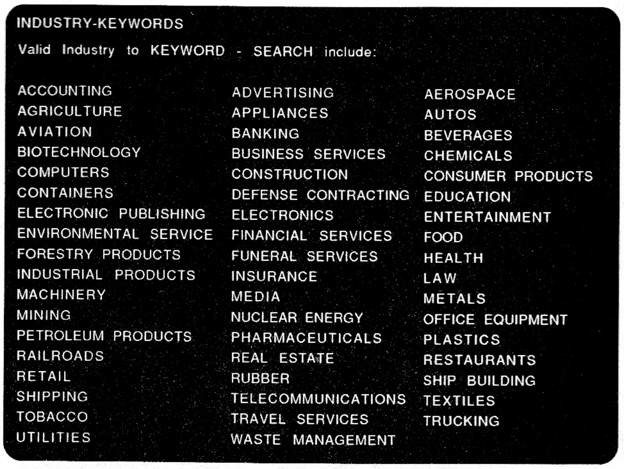
Before going on-line decide on a search strategy. It may be slightly different for different services, but the general procedures remain the same: what are the broad topics (industrial codes, Dialindex acronyms); what keywords will find the records you want; which databases are likely to include information you need; which ones probably will not; and, perhaps most important, what is the result you hope to achieve? When searching for general topics to stay abreast of information in your field, the keyword and broad topic questions are very important. If you are searching for specific information about a narrow topic, you may have to spend more time constructing a search request and identifying databases of interest.

In any case, preplanning your search will provide better results and save time and money.

Search Regularly. Even with better front-end design, many on-line services are not that easy to use. You *can* learn them quickly enough and, given frequent use, searching becomes relatively intuitive. The key is regular use, expanding your horizons occasionally to attempt searches you don't do regularly. Read the printed material most services provide monthly or quarterly.

One way to gain searching expertise is to use the free time offers provided by most vendors. Usually once or twice a month you can spend up to a certain amount of time or run up a bill of a set dollar amount without charge on selected databases.

Even if the offered database is not one you normally use, browse it anyway. You may find information you didn't

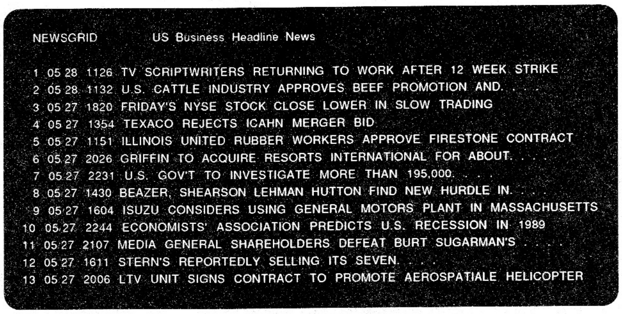


```
INDUSTRY-KEYWORDS
Valid Industry to KEYWORD - SEARCH include:

ACCOUNTING              ADVERTISING            AEROSPACE
AGRICULTURE             APPLIANCES             AUTOS
AVIATION                BANKING                BEVERAGES
BIOTECHNOLOGY           BUSINESS SERVICES      CHEMICALS
COMPUTERS               CONSTRUCTION           CONSUMER PRODUCTS
CONTAINERS              DEFENSE CONTRACTING    EDUCATION
ELECTRONIC PUBLISHING   ELECTRONICS            ENTERTAINMENT
ENVIRONMENTAL SERVICE   FINANCIAL SERVICES     FOOD
FORESTRY PRODUCTS       FUNERAL SERVICES       HEALTH
INDUSTRIAL PRODUCTS     INSURANCE              LAW
MACHINERY               MEDIA                  METALS
MINING                  NUCLEAR ENERGY         OFFICE EQUIPMENT
PETROLEUM PRODUCTS      PHARMACEUTICALS        PLASTICS
RAILROADS               REAL ESTATE            RESTAURANTS
RETAIL                  RUBBER                 SHIP BUILDING
SHIPPING                TELECOMMUNICATIONS     TEXTILES
TOBACCO                 TRAVEL SERVICES        TRUCKING
UTILITIES               WASTE MANAGEMENT
```

Figure 7. NewsGrid's industry "codes" are similar to NewsNet's.

Using On-line Databases for Current Awareness



```
NEWSGRID          US Business Headline News

 1 05 28 1126 TV SCRIPTWRITERS RETURNING TO WORK AFTER 12 WEEK STRIKE
 2 05 28 1132 U.S. CATTLE INDUSTRY APPROVES BEEF PROMOTION AND. . . .
 3 05 27 1820 FRIDAY'S NYSE STOCK CLOSE LOWER IN SLOW TRADING
 4 05 27 1354 TEXACO REJECTS ICAHN MERGER BID
 5 05 27 1151 ILLINOIS UNITED RUBBER WORKERS APPROVE FIRESTONE CONTRACT
 6 05 27 2026 GRIFFIN TO ACQUIRE RESORTS INTERNATIONAL FOR ABOUT. . . .
 7 05 27 2231 U.S. GOV'T TO INVESTIGATE MORE THAN 195,000. . . .
 8 05 27 1430 BEAZER, SHEARSON LEHMAN HUTTON FIND NEW HURDLE IN. . . .
 9 05/27 1604 ISUZU CONSIDERS USING GENERAL MOTORS PLANT IN MASSACHUSETTS
10 05/27 2244 ECONOMISTS' ASSOCIATION PREDICTS U.S. RECESSION IN 1989
11 05/27 2107 MEDIA GENERAL SHAREHOLDERS DEFEAT BURT SUGARMAN'S . . . .
12 05 27 1611 STERN'S REPORTEDLY SELLING ITS SEVEN. . . .
13 05 27 2006 LTV UNIT SIGNS CONTRACT TO PROMOTE AEROSPATIALE HELICOPTER
```

Figure 8. NewsGrid headline scan.

expect to see there, and the extra practice without the pressure of the ticking clock may increase your proficiency.

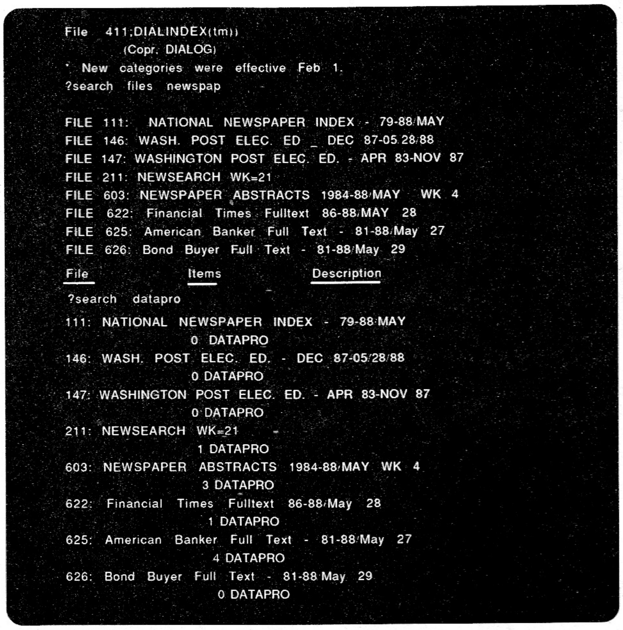
Seek Help. As on-line searching becomes more common, third-party companies are developing search aids, communications programs, local database management systems, training programs, and other aids to make your job easier. Often, the database provider will offer regular training sessions in cities near you. For some of these the only cost is your transportation and your time.

Many database providers have toll-free help lines to answer your questions and even help you construct specific search strategies. Use this service. The cost is built into the on-line charges.

Attend conferences, seminars, and shows. The on-line topic is appearing on the conference circuit more regularly. Seminar sessions in nonrelated shows often include database techniques. Such offerings are a good way to learn about on-line searching and to meet others who already have solved the problems you are facing.

CONCLUSION

Electronic information dissemination is the trend of the future. Increasingly, to remain competitive you will turn to on-line, CD-ROM, or local databases to keep abreast of current events in your field and in the political world. As one on-line searcher told us, "My competition is using these tools . . . I *have* to use them."



```
File   411;DIALINDEX(tm))
          (Copr. DIALOG)
*  New  categories  were  effective  Feb  1.
?search  files  newspap

FILE 111:   NATIONAL NEWSPAPER INDEX - 79-88/MAY
FILE 146: WASH. POST ELEC. ED _ DEC 87-05 28/88
FILE 147: WASHINGTON POST ELEC. ED. - APR 83-NOV 87
FILE 211: NEWSEARCH WK=21
FILE 603: NEWSPAPER ABSTRACTS 1984-88/MAY   WK 4
FILE  622:  Financial  Times  Fulltext  86-88/MAY  28
FILE  625:  American  Banker  Full  Text  -  81-88/May  27
FILE  626:  Bond  Buyer  Full  Text  -  81-88/May  29
File              Items              Description
 ?search  datapro
111: NATIONAL NEWSPAPER INDEX - 79-88/MAY
                 0  DATAPRO
146: WASH. POST ELEC. ED. - DEC 87-05/28/88
                 0 DATAPRO
147: WASHINGTON POST ELEC. ED. - APR 83-NOV 87
                 0 DATAPRO
211: NEWSEARCH WK=21
                  1 DATAPRO
603: NEWSPAPER ABSTRACTS 1984-88/MAY WK 4
                  3 DATAPRO
622:  Financial  Times  Fulltext  86-88/May  28
                   1 DATAPRO
625:  American  Banker  Full  Text  -  81-88/May  27
                   4 DATAPRO
626:  Bond  Buyer  Full  Text  -  81-88 May  29
                    0 DATAPRO
```

Figure 9. Sample Dialindex search.

The current state of the art has improved searching techniques and is offering more on-line data to a broader range of users. Most data providers report an increase in end-user access, while librarians and other professionals continue to use on-line services at the same or higher rates.

If you aren't already a member of the news search generation, start with one service. Experiment with short searches that will cost little. As you refine your skills, you also will learn more about how to apply this valuable resource. ☐

Accessing Books, Magazines, and Newspapers On-line

Fads and fashion affect the on-line information industry as they do any other—and it is not necessarily a bad thing. But sometimes in the rush to put more and more different *kinds* of information on-line, old standbys like books, magazines, and newspapers get left in the electronic dust. It is unfortunate, because for newcomers to the on-line field databases, books, magazines, and newspapers provide an ideal bridge between traditional paper- and microfiche-based research and electronic information retrieval.

Great numbers of people—including possibly yourself—could be working better and more productively with on-line information. One reason they may not utilize on-line information is a lack of knowledge about the system itself. Another is that once they discover the on-line world, they find it intimidating, unfamiliar, and strange.

Few people are familiar with patents and trademark documents, government statistical tables, graphic representations of chemical formulas, or any of the other on-line fads and fashions of recent years. Yet, nearly everyone deals with the print media every day. Most of us rely on published materials for a substantial portion of the information we need. Making the transition from paging through magazines to searching a database covering those magazines is thus an easy and natural step.

You yourself may fall into this category. You may have been put off by the esoteric, unfamiliar nature of much that you find on-line. This report will erase some of the unfamiliarity. It covers what is arguably the bread and butter of the on-line world. We will look, in turn, at books, magazines, and newspapers and offer suggestions on how to use these abundant resources to best advantage.

We will assume the following: you are a relatively new user, you are familiar enough with the on-line field to know what a database is, and you have at least heard of leading on-line systems like DIALOG, BRS, NEXIS, Wilsonline, and others. If you are not familiar with these services, a look at the Table of Contents (located in both volumes of this service) will make it easy for you to locate discussions of the relevant databases and on-line services.

We will begin with the search process and explore databases related to books, magazines, and newspapers. If you are an information professional, you might want to view this as a quick refresher, a chance to get reacquainted with techniques and terminologies.

Much of the information that is available on-line is of interest only to information professionals or other researchers in specific fields. There is also, however, much on-line information that is familiar and useful to us all. On-line databases, for example, can point you to nearly any book that's been published on any topic in the last 90 years; they can deliver the full text of such familiar magazines as *Time* and *Newsweek*; and they can furnish every story from *The New York Times* and *The Wall Street Journal*.

This report discusses where to find these familiar information sources on-line.

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Magazines: Facts, Figures, and Full-Text Articles 106
Newspapers 110

If you are a new user, you will find that concentrating on these kinds of databases first provides both an excellent introduction to on-line searching and a smooth transition from the paper to the electronic information age.

All on-line searches begin with one or more questions. Suppose you want to find the answers to questions like: What's the most popular brand of suspenders among Wall Street money-makers? Are CD players going to replace vinyl records? What did the most recent mission to Uranus discover?

That's the first step—stating your query. The next step is most crucial. All too often the next question end users ask themselves is, "Which database should I search?" That's perfectly natural, and it is the conventionally accepted procedure.

Unfortunately, that is the wrong question to ask at this stage. Information professionals have the background, training, and experience to make the leap, of course. But for new users, focusing on finding a specific database at this point leads immediately into a confusing maze of possibilities. We can use DIALOG, with its more than 350 database offerings, as an example.

The DIALOG database catalog provides short descriptions of databases arranged alphabetically. The catalog also contains a list of databases categorized by subject. These include agriculture and nutrition; economic data; markets, products, and technologies; chemistry; current affairs; social sciences and the humanities; and so on. In almost every case, each category contains a dozen or more individual databases.

▷

This Datapro report was developed by Alfred Glossbrenner. Mr. Glossbrenner is the author of *How to Look It Up On-line* (St. Martin's Press, Copyright © 1987) and other books on computers and communications. He is also a member of the *Datapro Directory of On-line Services* advisory board.

But there are no categories for suspenders, CD players, or space exploration. Nor are there any more general categories for fashion, electronics, or outer space. And this is just DIALOG. There are some 3,600 *other* databases on *other* systems to consider as well.

The extensive subject index found in Volume 1 of this service can be a major help in identifying a group of promising databases, of course. For here you will find far more categories than in any on-line service database catalog. Yet even this index cannot be as extensive and refined as to offer headings helpful for generalities. If it were, the index would occupy more pages than the combined two-volume directory.

You can and should use subject categories to identify groups of databases but will still have to choose from among numerous possibilities. Unfortunately, the names of the databases aren't always descriptive. What, for example, are you to make of databases called MEDIA GENERAL PLUS, PTS PROMT, ABI/INFORM, or TRADE AND INDUSTRY ASAP? You are still going to have to choose one or more databases to search, and while your selection may have been narrowed by a subject category, the essential problem remains.

As a second step, therefore, new users should then ask: "What kind of publication would be most likely to contain the information I seek?" Once you have taken this step, selecting a database is a simple matter of finding those that cover the publications you're interested in.

For example, what exactly do you want to know about suspenders and their popularity among well-dressed Wall Street executives? Are you interested in the topic solely from a fashion angle? Are you a novelist or reporter seeking an authentic detail? Or, perhaps you are contemplating an investment in a suspender-making company. Maybe you want to introduce a competing product with an improved design.

These are only a few possibilities. Yet as different as your reasons might be, in every case the question would be the same:

"What is the most popular brand of suspenders among Wall Street executives?" The same could be said of any on-line query.

Once you have given your query more thought, you will be able to draw—almost automatically—upon your familiarity with printed sources to identify the kind of publication most likely to contain the information you seek. After all, you wouldn't turn to *Time* or *Newsweek* for detailed corporate financial information. For the most in-depth coverage of any subject, a book would be the most helpful. For the most current, quick information, you would turn to a newspaper.

Once you've gotten it down to the type of publication, picking the database or databases to search is easy. Virtually all database descriptions, whether here in the Datapro Directory or in the DIALOG, BRS, ORBIT, or other catalogs, will tell you what kinds of publications the database covers.

Thus if you look up ABI/INFORM in the Datapro Directory and find that it "covers over 780 international business and management journals," you can assume that it covers all of the leading magazines in this area. You may not need any more information about ABI/INFORM than this. If you would like a complete "journals list" (to use the trade term) citing the titles of each of the magazines covered by the database, you need only contact the database producer (UMI/Data Courier). Virtually every database producer will be happy to supply you with coverage information free of charge. Many have toll-free numbers for you to call when making this request.

With that as background, let's look more closely at the resources available to anyone seeking information published in books, magazines, or newspapers. If a book has been published on a particular subject anywhere in the world, it is accessible with on-line electronic resources. A copy of it is easily obtainable—or photocopies of its pages. There are exceptions, but on the whole, this is the kind of scope and power electronic databases place at your disposal when it comes to books.

BOOKS AS INFORMATION SOURCES

If your needs are confined to information published in the last three or four years, you will almost certainly find the relevant books in the card catalog at your local library or in such printed reference works as R.R. Bowker's *Books in Print* (BIP) series (available for reference at most libraries and bookstores). But, of course, these volumes contain only a small fraction of what is available. To do a truly comprehensive search, you've got to go on-line.

The two major book databases in the electronic universe are LC MARC, created and maintained by the Library of Congress, and R.R. Bowker's *Books in Print*. Between them they cover virtually every book published in America since 1968. A third database, REMARC, covers everything before 1900 through 1967. Each of the two major databases has its own personality, and each offers information and points of access not found in the other.

Books in Print On-line

The *Books in Print* database is currently available on systems operated by DIALOG and BRS. It is the electronic equivalent of the subject, author, and title volumes of BIP available at bookstores and libraries. It also includes *Paperbound Books in Print*, *Books Out-of-Print*, and *Forthcoming Books*, a monthly subject, title, and author guide to books scheduled for publication within the next six months. That is the core of the collection. Bowker likes to say that its database includes all of the information in the most current printed editions of a dozen other book reference volumes, including *Medical Books in Print*, *Children's Books in Print*, and so on. In reality these books are just subsets of the core volumes.

BIP on-line currently contains records for more than 1 million titles produced by nearly 16,000 U.S. publishers, plus over a quarter of a million titles that have been declared out of print since 1979. Bowker adds anywhere from 75,000 to 95,000 new titles a year through monthly updates. Updates are more frequent during peak periods.

The defining characteristic of the *Books in Print* database is that it is derived from publications intended for use by people in the book business. Consequently, BIP on-line contains information on how a book is bound, what it costs, and whether the book is "Out of Stock", "Out of Print", or an "Active Entry" (available for ordering). Similarly, when it tells you that the book publisher is, say, Timescape, it usually does not go on to mention that this is an imprint of Simon & Schuster of New York. Booksellers usually know the imprints of the major publishing houses, and they have separate directories to guide them when they don't.

Regardless of the system you use, the best documentation for using BIP is the DIALOG's 46-page database chapter. BIP is File 470 on that system, and you must order the documentation from DIALOG.

LC MARC: Library of Congress Machine Readable Cataloging

The Library of Congress database, in contrast, is more of a librarian's database. Consequently, it contains information likely to interest professional catalogers.

Books enter the catalog of the Library of Congress (LC) by being submitted by their publisher. But since the Register of Copyrights is also part of LC and since LC maintains a cataloging and publications division, books may enter the system through those avenues as well. Usually mass market paperbacks are not included. Nor are paperback reprints of hardcover volumes already in the collection.

With over 2 million records and monthly updates containing 18,000 records or more (216,000 records a year), LC MARC certainly comes close to recording every book published in the U.S. Available on DIALOG, the database covers two files. File 426 includes books published since 1980. File 427 includes books from 1968 through 1979. The database starts with 1968 for English-language books; but it also contains books in every other major language, including titles in "Romanized" Korean and Chinese. The start date for foreign-language books varies, beginning with French in 1973.

LCSH: Library of Congress Subject Headings

Because of its size and influence, it was natural for the Library of Congress, working closely with the American Library Association, to establish and promulgate cataloging standards. Indexing and cataloging information is something most of us never have to think about. But if information is to be retrievable, it is crucial to have rules about how it will be filed.

For example, how should books by Mark Twain be filed? Under Mark Twain or Samuel Clemens? What subject headings should be used and how should each be phrased? "Corporation reports" or "Annual reports, Corporate"? "Animal nutrition" or "Animals, food habits of"? Right or wrong, for better or for worse, *somebody* has to decide. For decades the Library of Congress has assumed that burden.

The LC Cataloging Distribution Service publishes various "authority" volumes offering comprehensive lists of the cataloging terms that have been decided upon. (The system currently followed is called "ACR 2" for "Anglo-American Cataloguing Rules, 2nd edition.") The Name Authorities, for example, contain personal and corporate names, uniform titles, geographic names, and so on in the format the Library of Congress uses. Similarly, the subject authority, two volumes called *Library of Congress Subject Headings* (LCSH), contains the words, phrases, and formats LC uses in its subject cataloging.

These are the *same* subject headings you will use when searching LC MARC and *Books in Print* on-line. R.R. Bowker published a subject heading list of its own, but it now follows the LCSH standard. And Bowker is not the only database producer to do so. As discussed shortly, Information Access Company (IAC), one of the leading producers of *newspaper*- and *magazine*-related databases (Magazine Index, Newsearch, Management Contents, etc.) also uses the LC subject headings.

After a six-year hiatus, the tenth edition of this two-volume, 2,600-page reference work covering all headings current through 1984 was published in 1986 for $75. An annual supplement covered terms established in 1985. The eleventh edition, published in 1987, covers everything through 1986. This was the last of the annual supplements. To place an order or request a free catalog of other LC offerings and to obtain more information about the LC MARC database, contact:

Cataloging Distribution Service
Library of Congress
Washington, DC 20541 (202) 287-6100

While the LSCH volumes are a good value, and the Cataloging Distribution Service has worked hard to hold the price to $75, you may find that the volumes are so huge that they represent subject-heading overkill for your purposes. Consequently, you might want to consider ordering *The Subject Guide to IAC Databases* from Information

Access Company instead. The cost is $85, and, at 575 pages, it is much more manageable.

The guide isn't as exhaustive as LSCH; and since IAC must be responsive to the rapidly changing subjects reported by newspapers and magazines, the company has supplemented authorized LC headings with terms of its own. But you may find that it gives you everything you need, and it has the advantage of doing double duty as a reference for both book databases and IAC magazine databases. For more information, contact:

Information Access Company, Inc.
11 Davis Drive
Belmont, CA 94002 (800) 227-8431 (415) 591-2333

Using LC Subject Headings

The LCSH volumes are useful because they help focus your thinking and because they suggest words to search on that might not normally occur to you. You might not think to search on "Domicile of corporations," for example, or on "Tort liability of charitable organizations." But those are both authorized LC subject headings, and all you would have to do on DIALOG would be to enter SELECT followed by one of those phrases without the quotation marks to locate a set of relevant titles.

Unless you plan to do a lot of book searching, however, you can probably get by *without* buying the LCSH volumes. Try a search on the topic you are looking for using your best guess as to how it should be phrased. If your results aren't satisfactory—if you get too many hits or no hits at all—call the database vendor's Customer Service number for assistance. You might also call your local librarian. Even the smallest libraries typically have the LCSH volumes.

As mentioned, the *Books in Print* database is available on systems run by both BRS and DIALOG. But in addition to being on DIALOG as LC MARC, the LC database is also available on ORBIT as LC LINE, and on Wilsonline as the Library of Congress MARC Book File. It may eventually appear on other systems as well.

One or Both?

You don't *have* to search both databases when you are looking for a book, of course. But anyone who is looking for a book on-line should be aware of the different personalities of the two files. As a cataloger's database, for example, LC MARC typically doesn't contain a book's price unless the publisher has printed it on the title page or on the opposite side of that page with the copyright information. Nor will you find notations on whether the book is out of print. But since both of these pieces of information are important to booksellers, you will almost always find them in the *Books in Print* database.

```
1321912  0472795XX
  The Citadel of the Autarch
  Wolfe, Gene
  Series: The Book of the New Sun Ser.,; Vol. 4
  Timescape
  PB 01/1983
  Trade $15.50
  ISBN: 0-671-45251-7
  Status: Out of print (08-85)
```

Figure 1. A sample record from the Books in Print database.

To get a feeling for the differences between BIP and LC MARC, compare the records shown in Figures 1 and 2, both of which were downloaded from DIALOG. Figure 1 shows how BIP lists *The Citadal of the Autarch*, a science fiction novel by Gene Wolfe. Figure 2 shows the listing for the identical book in LC MARC.

Since both Figure 1 and Figure 2 represent their respective database's "full record" formats, each presents everything there is in its respective database on this particular edition of this book. Notice how much more detailed the LC MARC record in Figure 2 is. Indeed, LC MARC records on DIALOG may have as many as 24 fields. Nor does this particular BIP record (Figure 1) include the book's Library of Congress Catalog Number (LCCN), though as you can see from the first line of the LC MARC record, the book obviously has one. At the same time, the LC MARC record makes no mention of price or of the fact that this particular edition is a trade paperback or that it is out of print.

The two databases complement each other in other ways as well. Sometimes, for whatever reasons, LC MARC will contain titles not found in BIP and vice versa. When we searched BIP with the command SELECT AU=WOLFE, GENE, we got 25 hits. When we did the identical search on LC MARC, we got only 10 hits. But among them was this record displayed in Figure 3 using DIALOG's "tagged" format.

We checked and found that this book is not in the *Books in Print* database. The book referenced in Figure 3 is obviously a collector's item published by a small press in New Castle, Virginia. Significantly, the LC MARC record gives you the information you need to contact the publisher.

```
1669837  LCCN: 82005964
  The citadel of the autarch / Gene Wolfe
  Wolfe, Gene.
  Series: His Book of the new Sun ; v. 4; Wolfe, Gene.
  New York : Timescape Books : Distributed by Simon
  and Schuster, c1983 317 p. ; 22 cm.
  Publication Date(s): 1983
  Place of Publication: New York
  ISBN: 0671452517
  LC Call No.: PS3573.052C5 1983 Dewey Call No.: 813/.54
  Languages: English
  Document Type: Monograph
```

Figure 2. A record from the Library of Congress' LC MARC database.

```
FN-
DIALOG LC MARC FILE 426
AN-
9015610
LC-
83156127
TI-
Quicks around the zodiac : a farce / by Fritz Leiber ; with
an afterword by Gene Wolfe ; illustrated by Alicia Austin
AU-
<Main Entry> Leiber, Fritz, 1910-
AU-
<Added Entry> Wolfe, Gene.; Austin, Alicia.
IM-
New Castle, Va (Rte. 2, Box 293, New Castle 24127) :;
Cheap Street, c1?-983.
PH-
25, [4] p. : ill. ; 23 cm.
PY-
1983
PU-
<Place> Virginia
CA-
<LC> PS3523.E4583Q5 1983
CA-
<Dewey> 818/.5407
LA-
English
DT-
Monograph
NT-
Wolfe's afterword, dated Oct. 1982, has caption: Vunce
around der momma's kitchen / by Hans Katzenjammer.;
"There were twenty-seven lettered presentation copies
reserved for private distribution. Ninety-eight ordinary
edition copies were handsewn into wrappers of
Strathmore Rhododendron cover with Japanese silk
tissue endpapers ..."--P. [28]
```

Figure 3. Even rare books can be located on-line.

The notes field (NT) contains a comment by the LC cataloger pointing out unique features. In other records, the notes field will contain the names of individual book chapters, the titles of the poems or short stories, a one- or two-sentence summary of the work, and other information that can give you a better idea of what the book is about.

REMARC: Retrospective MARC

The MARC format was established and the database was begun in 1968 by what was then called the Card Division of the Library of Congress to help automate the production of catalog cards for libraries subscribing to that LC service.

But what about books published prior to 1968? It is estimated that the Library of Congress contains 5.2 million non-MARC cataloging records. To make *these* records available in magnetic form, REMARC (REtrospective MARC) was created. This is an ongoing project now supervised by the University of Toronto Library Automation System (UTLAS) International. Its American subsidiary is UTLAS USA, Inc. The firm acquired Carrollton Press, the original REMARC database producer.

REMARC is divided into five files on DIALOG, starting with File 421 (pre-1900) through File 425, which starts in 1970. At this writing, these files include more than 4 million records. The pre-1900 file includes some 836 titles from the 16th Century, over 17,000 titles from the 17th Century, and literally millions more from then on.

Among the earliest records in the database are a Spanish hymnary, a German woodcut pamphlet extolling the virtues of Brazil, and the curious volume cited in Figure 4.

How to Obtain an Out-of-Print Book

You can order any book currently in print from your local bookseller. For out-of-print and rare books, consult the Yellow Pages of your phone book for rare book dealers or see if your library has a copy of the *Directory of Specialized American Bookdealers*, published by Moretus Press, Inc., New York, or *Book Dealers in North America*, published by The Sheppard Press, Ltd.

You may also wish to consult University Microfilms International (UMI). UMI's Article Clearinghouse is one of the leading document delivery services, an excellent source for photocopies of most magazine articles. But UMI has another division called Books on Demand (BOD). BOD will send you a photocopy of any of the more than 100,000 out-of-print books in its collection.

Books are copied on acid-free paper and delivered within 30 days. The cost is $0.25 per page, including paper binding. Cloth covers are available for $6 extra per book. The minimum charge is $20 and the maximum is $160. (Microform copies are available for some titles at half the price of the photocopy.) Shipping within the United States and Canada is billed at applicable rates. Shipping outside the U.S. and Canada is 15 percent extra. Prepayment is required for individuals, but Visa, MasterCard, and American Express cards are accepted. For more information, contact:

University Microfilms International
300 North Zeeb Road
Ann Arbor, MI 48106

From the continental U.S.: (800) 521-0600, for BOD information (800) 732-0610, for Article Clearinghouse information

From Canada: (800) 343-5299 (ask for UMI)

```
0203657   LCCN: 52046851
   Coniuratio malignorum spirituum
   Uniform Title: Coniuratio malignorum spirituum
   [Rome, Eucharius Silber, 1500 [8] l. 14 cm.
   Place of Publication: Italy
   LC Call No.: DG804.M65 (Rare Bk. Coll.)
   Languages: Italian
   Document Type: Monograph
   Descriptors: Exorcism
```

Figure 4. Very old books can be found on-line as well.

From Michigan and everywhere else: (313) 761-4700

MAGAZINES: FACTS, FIGURES, FEATURES, AND FULL-TEXT ARTICLES

Pamphlets, periodicals, and "serials" of one sort or another have been published for centuries, but what we today think of as a magazine is a modern phenomenon dating from the 1920s.

Today there are literally tens of thousands of magazines. As the R.R. Bowker Company puts it in its description of its *Ulrich's International Periodicals Directory* (DIALOG and BRS), the "database provides you with immediate access to more than 126,200 regularly and irregularly issued serials from 65,000 publishers in 181 countries around the world." (Plus information on more than 16,800 serials that have ceased publication since 1974.)

The reason there are so many publications is that the magazine format fills a need that is especially acute in the midst of an information explosion. At one end of the information continuum are television and radio. After that are daily newspapers. Then come magazines and finally books.

A Living Encyclopedia

You have virtually no control over the information the electronic media offer you. The depth of coverage usually is not great, and video- and audiocassette recorders notwithstanding, it is ephemeral. Newspapers offer more depth and a wider choice of subjects, but they are still a general interest medium. Books provide maximum depth and maximum choice, but they also demand maximum commitment.

Magazines, on the other hand, come in so many varieties that you can find one devoted to nearly any subject imaginable. Constantly updated with the latest information, one could almost call magazines living encyclopedias of our time.

There are three types of magazine databases. The first might be called an "index" or "reference only" database. The best example is the *Readers' Guide to Periodical Literature*. Records in these databases are generally limited to the title of the article, the author, the source publication, and the subject descriptor words of a bibliographic citation (bibcite).

Next are the databases that include not only the bibcite but also include about 200 words of information abstracted from the source article. The third category is databases in which each full record is actually the complete text of the original article. On most systems, whatever is in the record is searchable, and as we'll see, that's an important consideration when you go on-line. There are times when you may not want to search the full text of an article, and others when nothing but a full-text search will do.

A Periodical Directory

We will look at several of the leading magazine-related databases in a moment. But first there is an important publication you should know about. This is the *Directory of Periodicals On-Line* published by Federal Document Retrieval, Inc. (FDR). Nearly three years in the making, this book is a boon for anyone who wants to know which databases cover which magazines. As noted earlier, most database producers will gladly send you a journals list citing the publications they cover, so it's not a problem to find out which magazines are on IAC's Trade & Industry Index or any other database. But until FDR published its directory in late 1985, there was no single source one could consult to find out which databases cover *Institutional Investor* or *Newsweek* or any other periodical. Ask if your local library has this volume, or contact:

Federal Document Retrieval, Inc.
Directory of Periodicals on-line
514 C Street, NE
Washington, DC 20002 (800) 368-1009 (202) 638-0520

Index-Type Magazine Databases

Though it was late getting out of the starting blocks in the on-line field—it didn't appear until 1985—the H.W. Wilson Company's *Readers' Guide (RG)* is probably the quintessential index-type magazine database. It corresponds almost exactly to contents of the RG volumes you would find at most libraries. For example, Figure 5 shows the search results of RG with the command FIND PAPER AIRPLANES.

In the best tradition of all index-type databases, this citation tells you everything you need to know to locate the source article. Other citations referencing articles on paper airplanes appeared in *Science '85*, *Time*, *Sunset*, *Omni*, *Popular Mechanics*, and *The Mother Earth News*. The total on-line time required for this search was 1 minute and 29 seconds. The cost was $0.98.

```
1 (READERS GUIDE)
Fold a far-flying paper airplane
il
National Geographic World 128:22 Ap '86
Feature Article
Language: eng
Subject heading: Airplane models
Special refs: Paper airplanes
BRDG86022745
860509
Article
```

Figure 5. Searching Readers Guide on Wilsonline.

Accessing Books, Magazines, and Newspapers On-line

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Perhaps only a writer or a professional researcher can appreciate the speed and economy having RG on-line provides. But for those who haven't spent much time in the reference room of a library, a brief explanation may be helpful. In the library world, the various H.W. Wilson volumes have long been the magazine reference volumes. The information is published in monthly booklets that are cumulated each quarter. At the end of the year, all of the quarterly booklets are integrated and combined into one hardbound volume.

Thus, if you wanted to search for articles about paper airplanes dating from 1983 to the present, it would be necessary to consult a number of volumes. If you did your search in 1986, you would have to check the yearly volumes for 1983 through 1985 (three volumes). Then, depending on when in 1986 you did your search, you would have to check anywhere from one monthly booklet to as many as three quarterly booklets, plus the two monthly booklets issued prior to the end of the fourth quarter.

No fewer than four separate reference volumes would be required if the search were done by hand. You would have to copy the pertinent information for seven citations onto a piece of paper before heading into the stacks to locate the actual articles. You will want to consult the H.W. Wilson report (Page OL20-450-101) in Volume 1 of this publication for more information, but it is worth noting that altogether the databases available on this system cover nearly 3,000 unique periodical titles, with approximately a 10 percent overlap among its various databases. The start date on these databases varies from June 1982 through October 1984. The databases are updated at least twice a week, more frequently when necessary.

The IAC Databases and Database System

Since Information Access Company is such a major presence in the magazine and newspaper indexing field, it is worth taking a moment to examine its offerings as a whole and the way they interact. All IAC databases are largely based on periodicals and newspapers. And all of them are available on DIALOG where they comprise not so much a collection of discrete files as a database *system.* Most are also on BRS and NEXIS as well.

Publications enter the system in the NEWSEARCH database, File 211 on DIALOG. NEWSEARCH contains bibliographic citations and abstracts prepared from over 1900 source publications, including the major national newspapers, PR Newswire, over 100 local and regional business publications, and hundreds of magazines. NEWSEARCH is updated *daily.* More than 1,600 new records derived from the previous day's news stories are added to the database every business day.

Every 30 to 45 days, all the records that have been added during the month are collected and distributed to other IAC files. The clock is reset, and the process begins again. These other IAC databases include *Magazine Index*, *Magazine ASAP*, *Management Contents*, the *National Newspaper Index*, the *Legal Resource Index*, *Trade and Industry Index*, *Trade and Industry ASAP*, and *Industry Data Sources* (the on-line equivalent of the Harfax printed directories of market and investment research; statistical, financial, and economic reports, and similar information). Also included is the COMPUTER DATABASE, which covers over 600 computer magazines, and COMPUTER ASAP, which provides the full text of the articles from a selected subset of this database.

```
 *TIDE*HASN'T TURNED YET
 Freeman, Laurie
 Advertising Age   v56n90   PP: 43   Nov 18, 1985
 CODEN: ADVAAQ  ISSN: 0001-8899  JRNL CODE:
 ADA
 DOC TYPE: JOURNAL ARTICLE   LANGUAGE: English
 AVAILABILITY: ABI/INFORM

  Liquid*Tide,*introduced by Procter & Gamble (P&G),
captured a 6.8% share of the $1-billion liquid
detergent*market*in the first half of 1985, although its
growth was slower than many had anticipated. More
than half of Liquid*Tide's* share came at the expense of
existing P&G brands. A heavy media schedule,
including television spots from Saatchi & Saatchi

Compton, has promoted the new detergent. Still, it has
not ousted Wisk from the number one spot. Use of liquid
detergents is approaching 50% in the northeastern and
north central US. Colgate-Palmolive is spending mil-
lions to introduce its new Fab liquid and its reformulat-
ed Dynamo, renamed Dynamo 2. Currently, Lever also is
testing a Wisk powder. Lever spends 95% of its $50
million advertising budget on TV spots. Lever also plans
to introduce Surf liquid and powder detergents and a
liquid under its Sunlight brand.
  DESCRIPTORS: Soap-&-detergent-industry;
Advertising-campaigns; Procter-&-Gamble-Cincinnati;
Advertising-agencies; Lever-Brothers-New-York;
*Market-shares;* Product-lines; Colgate-Palmolive-
New-York;   Market-strategy;   Test-markets;
Product-introduction
  CLASSIFICATION CODES: 9110 COMPANY SPECIFIC/
CASE STUDIES; 8610 FOOD PROCESSING INDUSTRY, IN-
CLUDES BEVERAGES & LIQUORS; 7200 ADVERTISING;
8300 OTHER SERVICES
```

Figure 6. An ABI/Inform abstract.

The Full-Text Link

The three ASAP ("As Soon As Published") files contain full-text magazine articles (exclusive of artwork and graphs). The three parent files, MI, TI, and CD, offer bibliographic citations covering hundreds of publications each. The ASAP files offer the full text of the articles in 45 to 80 of those publications. Coverage starts with January 1983.

Each ASAP record consists of the bibcite found in the parent file *plus* the full text of the article. On DIALOG, the ASAP databases are linked to their parent bibcite databases, MI, TI, and CD.

This linkage creates what might be thought of as an instant document delivery service. MI, TI, and CD contain *only* citations, but they cover scores of journals. Typically

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▷ you would search them, develop a list of citations for the articles you would like to see, and use DIALOG's on-line ordering commands to transmit those citations to your chosen document delivery service. You would still do that in most cases, but in those instances where a journal is covered by an ASAP database, you can order the immediate display of the full text of the document. In other words, while you cannot search the full text of a document in MI, TI, or CD, you can take advantage of its existence in an ASAP database.

A Quick Overview of IAC's Products

Here is a quick rundown of IAC's magazine databases. This is intended only to give you the flavor of each database. IAC will supply complete journal lists and other information.

Magazine Index

This database features bibcites, primarily, although about 5 percent of the records have very brief abstracts. It provides general interest coverage, including some 400 widely read U.S. and Canadian magazines. Originally conceived as a direct competitor to the printed *Readers' Guide*, MI includes all publications RG covers and many, many more. Some coverage goes back as far as 1959, but most indexing starts with January 1977.

Magazine ASAP

Magazine ASAP features full-text articles from about 60 magazines, starting with January 1983. The cost per article downloaded is $7, plus telecommunications and connect time.

Trade and Industry Index

Like MI, the database provides primarily bibcites with the occasional rough abstract. Coverage begins in January 1983. Over 300 publications are included, plus *The Wall Street Journal* and the Business Section of *The New York Times.* Business-related articles from over 1,100 other publications, including a subfile called the Area Business Databank that features over 100 local and regional business publications, also make up this index. This listing leans heavily in the trade publications area, an invaluable source of highly concentrated information on a particular industry.

Trade and Industry ASAP

The full-text of over 80 of the leading trade journals is provided in this database, plus such major magazines as *Forbes*, *Dun's Business Month*, *Fortune*, *Money*, and *Women's Wear Daily*.

Management Contents

Most records have *abstracts* as well as bibliographical citations. Management Contents covers more than 700 business journals, newsletters, proceedings, books, research reports, and self-study courses, starting in September 1974. Management Contents was originally handled by another company, but it was made a part of IAC in the fall of 1984. Perhaps because of its origins, there is more than a little overlap between it and TI; however, TI tends to be characterized by trade journals of the sort cited earlier. Management Contents is characterized by publications such as *ABA Banking Journal*, *Barron's*, *Canadian Labour*, *Management Japan*, *Long Range Planning*, and *Venture.*

The Computer Database

Originally started by Management Contents, most Computer Database records have informative *abstracts* as well as bibcites. Coverage begins in 1983. Updated twice a month with an average of 3,000 records per update, indexes and abstracts from over 600 journals, proceedings, courses, newsletters, and reports are included.

Computer ASAP

The newest of the IAC databases, Computer ASAP provides full text and indexing for 70 percent of the articles currently indexed in the Computer Database. According to DIALOG, one of the database's vendors, the file contains articles from 46 of the most widely circulated English-language journals in the computer field.

Legal Resource Index

This file contains bibliographical citations from over 730 law reviews, bar association journals, subject-specific journals, and seven legal newspapers. In addition to all the American publications you would expect, it has especially good coverage of publications from Canada and Australia. Coverage starts in January 1980 in most cases, and you can search on the basis of case citation, case name, jurisdiction, statute citation, and statute name, in addition to conventional fields.

Standard "IAC System" Features

One of the advantages offered by the IAC "database system" is the standardization of features in all files. Every IAC file uses the Library of Congress Subject Headings (LCSH) previously discussed as the authority for the words and phrases used in the descriptor fields. However, since magazines bring new subjects to light much faster than books, IAC has augmented the LCSH subject terms with headings of its own. Together they form the IAC controlled vocabulary. ▷

There are many other access points as well. To make retrieval easier, IAC has added vernacular and popular phrases that are mentioned in the source article but are not a part of the firm's controlled vocabulary list. In records prior to April 1984, these "uncontrolled" terms are in the "Identifier" field. Reflecting a change in policy, records added after that date contain both types of terms in the "Descriptor" fields, which were formerly reserved for authorized subject headings only.

Crucial Documentation

To make the most of any IAC database, you need at least two things. First, you need the appropriate DIALOG database chapter with its plentiful explanations and examples of what you can search for in each field. The cost is about $6 per chapter, and you must order directly from DIALOG. If you think you might be searching all IAC databases, consider ordering a chapter for each at the same time.

The second thing needed is a list of the journals each database covers. These are available for free from IAC, and you should probably request *all* of them, including the Area Business Databank list. There is also a list of geographic codes used in IAC databases that is free as well.

IAC publishes at least two other search aids that may be of interest. The first is its 575-page *Subject Guide to IAC Databases*. This volume contains a majority of the most frequently used Library of Congress Subject Headings, plus all of the terms IAC has created to supplement them. You can use the guide effectively on almost any database that follows the LCSH controlled vocabulary.

Abstract-Type Magazine Databases

An abstract is a brief summary of a source document. In its broadest form, it is most similar to the "Executive Summary" you might find on the first page of a long report. In the on-line world, however, it is often much more than that. For example, in Figure 6 you will find a complete record downloaded from the ABI/INFORM database on the DIALOG system. We wanted to find out what share of the laundry detergent market Procter & Gamble's Tide holds.

As you can see from Figure 6, an abstract does at least two things. First, it gives you a clearer idea of the content of the article—much better than would be possible with a bibliographical citation. You can thus more easily decide whether you want to seek an actual copy of the source article. Second, it contains enough factual material that the abstract itself may tell you all you need to know. The abstract is, in effect, the very essence of the source article, distilled, compressed, and concentrated for magnetic storage and on-line consumption.

The Abstract Leaders: ABI and PTS

Among information professionals, two databases have long enjoyed a well-deserved reputation for thoroughness and quality in the magazine abstracting field. These are Data Courier's ABI/INFORM and the Predicast databases. You will want to consult the relevant pages of the Datapro Directory for more information on each of these. Suffice to say at this time that you can't go wrong searching either one. Because each takes a slightly different approach to magazine abstracting, they tend to complement each other. So searching both ABI/INFORM and the PTS databases is often a wise policy.

The "ABI" in ABI/INFORM originally stood for "Abstracted Business Information," but the letters have since been adopted as the complete official name. INFORM covers some 680 publications, and each of its records contains a bibcite and a 200-word abstract. The journals list includes all of the business magazines you would expect, plus virtually every publication with business, economic, or management in its name. If a magazine name begins "Journal of . . ." and is in any way business related, it is sure to be on the list. Among those publications are many Canadian journals, plus more than 180 from Western Europe, Japan, and Australia. Articles from international publications are translated into English.

For major "core" business publications ABI/INFORM covers everything *except* news items, letters to the editor, book reviews, and regular columns. It focuses instead on feature articles dealing with methods, techniques, and tactics and strategies of interest to managers and other professionals. The subjects must be judged to be of lasting value. That means articles dealing with management, general business, strategy, planning, and similar topics will be included. But advice on current stock picks would not be included. Articles from noncore journals must meet the same criteria and be at least one page in length.

Like ABI/INFORM, the PTS databases offer very informative, high-quality abstracts of business periodical and magazine articles. But, as mentioned earlier, the selection and editorial policies of the two databases complement each other, even when they cover the same journals. If you want to know about the computer industry in general, ABI/INFORM should be your first stop. But if you want to know about IBM, its position in the industry, the mar-

```
AN   65142.  8509.
DB   NOOZ.
TI   American politicians and the trouble with public-
     opinion polls; Larry the Lobster's predicament
     shows how silly surveys can become.
AU   Dillin-John.
SO   Christian Science Monitor (CSMOBF), Dec 6, 1983,
     Tue edition, p1, col 1.
PD   831206.
CI   COLUMN INCHES: 029.
DE   public-opinion-polls: analysis. election-forecasting:
     analysis. Gallup-Poll: statistics.
```

Figure 7. A bibcite from the National Newspaper Index database.

ket share held by one of its products and those of its competitors, you should use PROMT. This is a very rough comparison, but both Information Producers confirm that it is essentially accurate.

Both by history and by design, PROMT is the master PTS database. It covers more than 1,500 trade magazines, business journals, newspapers, and annuals, including over 200 non-U.S. publications. (PROMT abstracts are always in English, with appropriate notations of the language of the source article.)

NEWSPAPERS

Finally, let's turn to the last major kind of publication we will address: the newspaper. Frankly, tapping an on-line database is not the best way to get the latest news. In fact, it's among the worst. A big-city daily will give you far more information for far less money. Unless you need a special kind of news, such as stock quotes that can affect your investment activities, it simply doesn't make sense to get your news on-line, despite what some database vendors would have you believe.

News is valuable on-line only when it's available for retrospective searching. Then it can be quite valuable indeed. If you know where to look, you can get an informative report on anything that happened, anywhere in the world, in the last 20 years.

Index-Type Newspaper Databases

The National Newspaper Index (NNI) and NEWSEARCH are both parts of the Information Access Company (IAC) database "system" described previously. NNI is available on DIALOG, BRS, and NEXIS. At this writing, NEWSEARCH is available only on DIALOG. The difference between them is that NEWSEARCH is designed for currency. All IAC records start out there, but after 30 to 45 days the records are transferred to their permanent homes in other IAC databases (Magazine Index, Management Contents, Trade & Industry Index, etc.).

If you want the latest information from all of the publications IAC handles, you can simply go into NEWSEARCH rather than go to each of the IAC databases separately. There's even a "Week Indicator" field to make it easy to retrieve records for a given week. (Keying in WK=nn, where nn is the week number, is easier than keying in a range of dates.) And starting with records added in March of 1986, you can specify COMPANY PROFILE in the "article type" field to limit retrieval to just corporate information.

IAC adds over 1,200 records to NEWSEARCH every day, and while the indexing of magazines may take a bit longer, indexes for the newspapers are available 24 hours after publication. As the DIALOG Bluesheet points out, "All articles, news reports, editorials, letters to the editor, obituaries, product evaluations, biographical pieces, poetry, recipes, columns, cartoons, illustrations and reviews are included." The only items not included are things like minor personnel notes, stock market tables, weather charts, and horoscopes.

NEWSEARCH and the National Newspaper Index cover the following newspapers: *The Wall Street Journal* (WSJ), *The New York Times* (NYT), the *Washington Post* (WP), the *Los Angeles Times* (LAT), and the *Christian Science Monitor* (CSM). Coverage in NNI starts with January 1, 1979. Figure 7 illustrates a typical bibcite record (on BRS) for this database.

Abstract, Index, and Full-Text Newspaper Databases

The Information Bank was started by the New York Times Information Service in 1968, largely as an outgrowth of the computerization of that firm's widely used print publication, the *New York Times Index*. From the beginning, however, the "InfoBank" covered more than just the *Times*. Most of the 10 papers and 40 magazines and other publications it includes are now covered elsewhere, though no other system goes back as far. At least a few of its offerings have remained exclusives.

The Information Bank has been through a lot of changes since its inception. When the parent company decided to vacate the database vending business in 1983, the operation was purchased by Mead Data Central. The InfoBank, along with the full text of *The New York Times* is now available exclusively on Mead's LEXIS/NEXIS system. The full text of *The New York Times* is on-line and available for searching within 24 hours of its publication. The file dates from January 1, 1980.

The Wall Street Journal

No discussion of on-line newspapers would be complete without the nation's premier business daily—*The Wall Street Journal*. By 6 a.m. Eastern time each weekday morning, the full text of the day's *Wall Street Journal* is available for searching on the Dow Jones News/Retrieval Service (DJNR). The database is sometimes called "TEXT 1" because it is the first selection on the //TEXT section menu.

Full-text coverage starts with January 1984, and every feature and news article is available, including letters to the editor and the cultural page. The only things that are omitted are advertising, stock quotes, currency rates, and similar ephemeral material, plus any tabular material not attached to an article. A table summarizing current oil prices, for example, would not be included. A table reporting raw steel production compared to capacity utilization that was part of an article on that topic would be in the database. The //TEXT database also includes the full text

▷ of the *Washington Post* since January 1984, available within 48 hours of publication.

VU/TEXT and DataTimes

These two vendors specialize in providing on-line access to the full text of newspapers. Each has carved out its own niche—VU/TEXT specializes in Knight-Ridder newspapers (e.g., *The Philadelphia Inquirer*), while DataTimes concentrates on Gannett newspapers (e.g., *USA Today*). For additional information on the offerings of these two vendors, see their respective reports in Volume 1 of this directory (the DataTimes report begins on Page OL20-356-101; the VU/TEXT report begins on Page OL20-961-101).

CONCLUSION

We have not attempted to discuss all of the databases that cover books, magazines, and newspapers. To do so would require far more space than we have here. Instead we have concentrated on what are widely acknowledged to be the leading databases in each of these areas.

If you immediately begin looking for a database, you will almost certainly end up in a confusing maze of possibilities. By focusing your efforts first on the kind of publication and *then* on the databases that cover that kind of publication, you are almost guaranteed success. ☐

Using On-Line Databases for Competitive Analysis

In this report:

Accessing On-Line Data .... -103

Using On-Line Data for Competitive Analysis .... -106

Summary................... -109

This report will help you to:

- Assess the value of using on-line databases for performing competitive analysis research.
- Identify databases that may be of value to your research.
- Use those databases effectively.

State of the Art

On-line information is available to assist virtually anyone involved in business, education, or scientific research. Although it is impossible to point to a single discipline or research technique as the most widespread among on-line searchers, competitive analysis is certainly among the most common.

The on-line availability of business and other information via dial-up or direct access local databases enables rapid retrieval and comparison of data from hundreds or thousands of sources within minutes. On-line databases have been available for years, of course, but a number of developments have converged to make on-line databases available to a wider range of users.

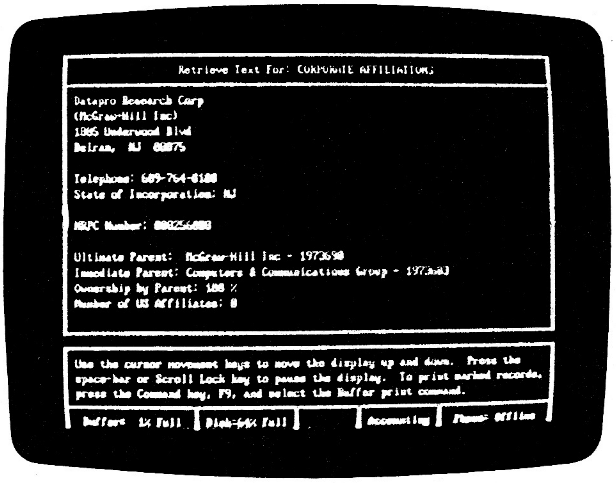
The advent of personal computers and low-priced terminals. The popularity of personal computers increases the number of potential on-line customers. Because more and more installed PCs now include modems and communications software, more PC users are able to access on-line data.

A noticeable trend toward moving traditional on-line databases to local minicomputer or PC-based workstations. This is possible because of new high-capacity, relatively low-cost storage devices. Magnetic disks for PCs in the 40-to-300 megabyte range are now readily available, and CD-ROM technology has an extremely attractive cost/performance ratio. PC-based networking and the rise in popularity of minicomputer servers for PC networks also contribute to the trend toward in-house research data. Users appreciate the advantages of working on data in-house, and most user interface software is designed to operate on local data instead of dial-up or remote information.

An increased number of databases. Companies are increasingly

Delran NJ 08075 USA

Figure 1.
Record from DIALOG's Corporate Affiliations Database



```
Retrieve Text For: CORPORATE AFFILIATIONS

Datapro Research Corp
(McGraw-Hill Inc)
1805 Underwood Blvd
Delran, NJ  08075

Telephone: 609-764-0100
State of Incorporation: NJ

NRPC Number: 000256000

Ultimate Parent:  McGraw-Hill Inc - 1973690
Immediate Parent: Computers & Communications Group - 1973683
Ownership by Parent: 100 %
Number of US Affiliates: 0

Use the cursor movement keys to move the display up and down.  Press the
space-bar or Scroll Lock key to pause the display.  To print marked records,
press the Command key, F9, and select the Buffer print command.

Buffer= 1% Full | Disk=64% Full |  | Accounting | Phone= Offline
```

Other financial and corporate databases can display financial, personnel, and other information about public and private companies.

using the power of electronic databases to track information vital to their operations. Providers—carriers—of this data are making it their business to distribute this information to a growing user base.

The decreasing cost of accessing on-line information. Most on-line data providers still charge for their services by connect time. In most cases, the availability of high speed modems has not increased connect charges. Although some information providers charged premium prices for 1200 bps access when 300 bps was the prevalent rate, that distinction has mostly disappeared. Today, very few services charge more for 2400 bps service than they do for 1200 bps. Even those that do charge more for higher speeds do not charge a rate commensurate with the benefits derived. For example, NewsNet's basic connect charge at 1200 bps is $60 per hour. At 2400 bps, the rate increases only to $90. Therefore, for only a 50 percent cost hike, the user accesses information at *twice* the speed.

In addition to these price advantages, most on-line databases are growing rapidly. Some are updated daily, others weekly or monthly. As the size of the data offering increases while charges remain constant, the purchaser receives more value for each on-line dollar. Granted, the larger the database, the longer it can take to complete a search. With efficient file indexing and a sound search strategy, however, the incremental costs associated with searching larger databases are small compared to the benefit of the additional information.

More friendly user interfaces to the electronic data. Most large databases are developed and stored on mainframe computers. These machines provide the speed and storage required for manipulating large amounts of information, but they generally are not user friendly. This was not a factor in accessing electronic data when most searching was conducted by information professionals—librarians, researchers, trained assistants—and not by end users. But, as more people have their own terminals and PCs attached to local and remote minicomputer and mainframe systems, they increasingly demand the ability to quickly access data.

This user demand has forced information providers to improve their data retrieval techniques. Menus, English-like commands, and context-sensitive help are replacing arcane, even cryptic, logon and search commands. Some information providers also offer PC software designed around the features of their individual service. DIALOG's DialogLink PC software, for example, handles many of the chores associated with connecting to the service and conducting a search. Such PC-based software "front ends" are becoming common as more end users conduct their own searches. In addition, many services offer menu-oriented slices of their on-line services that guide users through the on-line search process.

On-Line Charges

Searching data on-line can be either shockingly expensive or extremely cost effective, depending on your information needs and your frame of reference. There is a broad range of database charges; but across the most widely accessed services, the average cost is about one dollar a minute for connect time. In addition, some databases charge from $0.10 to as high as $85.00 for each complete record you view on the screen, and another $0.10 to $100.00 for each record printed off-line and mailed to you.

To put on-line charges in perspective, consider what it might cost to acquire this same information via conventional means. If you were to subscribe to all of the newsletters and news services transmitted by McGraw-Hill's *Executive One* service, for example, or the offerings of NewsNet, the annual bill could run more than $10,000. Even if you had printed copies of all these publications, conducting regular searches on specified topics would require several people full time just to keep the files straight.

A more realistic comparison, perhaps, is *Books in Print*. Subscribers generally pay around $1,000 per year for these volumes. On-line researchers can search the latest version of this publication for $65 per hour and get more than 15 hours of searching for the cost of a subscription. That is a long time on a single database. More importantly, when searching on-line you can look for information that is difficult or impossible to find in a printed document.

Accessing On-Line Data

The first step in successful on-line searching is learning to think in terms of electronic data acquisition instead of traditional research means. Many professionals in the electronic database field feel this is one of the most difficult hurdles facing new searchers. While database providers spend considerable time and money educating users about the benefits of on-line searching and the procedures for conducting successful on-line research, the task remains difficult.

At Princeton University, for example, an on-line system lets students and faculty search the card catalog from remote PC terminals and dial-up facilities. "While more people are beginning to use remote terminals in offices and dormitories," reports Marvin Bielawski of the Princeton library staff, "the majority of people access the card catalog through one of the terminals in the library." Bielawski predicts that more people will use remote access as the university adds other databases to its system.

Not only are many researchers simply not aware of the availability of on-line resources, but the companies that use them have not established a policy to monitor on-line expenditures. Since it is relatively easy to rack up a few hundred dollars, even a few thousand dollars, in search time, organizations are reluctant to give the end user a blank check to an information service.

The Electronic Alternative

Test yourself on electronic data awareness. Quickly read the questions below and respond with the first source or methodology that comes to mind for finding the information.

1. You have read about the business problems in Dallas, Texas. Now you have an opportunity to join a promising Dallas firm. What is the business climate really like? What is the housing market?

   Your immediate reaction to this question may be to scan current and back issues of *The Wall Street Journal*, *Time*, *Newsweek*, *U.S. News and World Report*, and maybe *Fortune* and *Inc.* That might provide a fair cross-section of major business trends and events in and around Dallas, but the research would be time consuming. Moreover, these publications do not cover local and regional stories that could greatly affect your decision.

   A faster, more efficient way to research this question would be to go on-line and search full-text articles from regional business publications on UMI/Data Courier's *Business Dateline* database and perhaps the *ABI/Inform* database. *Business Dateline* stores full-text articles from about 140 regional publications (*Dallas Magazine*, *Dallas Business Courier*, etc.). *ABI/Inform* offers comprehensive article summaries from over 600 national and international journals. These databases are available from DIALOG and other providers. A skillful searcher can glean the necessary information from both repositories in 15 to 20 minutes, at a cost of about $30. Manual searching could take hours or even days just to collect the information. Clearly, the on-line approach would free valuable time that could be used for analyzing the data and drawing conclusions.

2. You have an idea for a new book in your field, but before you pitch the idea to a publisher you want to know if the topic is already covered adequately in current texts. How do you determine this?

   If you answered *Books in Print* you are on target, but you are not thinking on-line if your first thought was to go to the library to scan a shelf copy. *Books in Print* and other literary references are readily available on-line. The on-line version of *Books in Print* alone covers the contents of 12 publishing reference books

Table 1. Databases Useful for Competitive Analysis or General Business Research

Database	Producer	Focus
ABI/Inform	UMI/Data, Courier, Inc.	Abstracts of business articles in over 780 business and management periodicals dating back to 1971.
AP Newswire	Associated Press	Full test of AP Newswire. Uploaded to database within 48 hours of transmission to AP subscribers.
ASI (American Statistics Index)	Federal Government	Abstracts of articles in the printed version of the *American Statistics Index*, produced by the Congressional Information Service, Inc. Indexed publications cover material from 500 U.S. federal offices.
BIS Infomat	Pergamon Financial Data Services	Abstracts international business news articles from about 500 trade and professional publications.
Business Dateline	UMI/Data Courier	Full text of major news and feature stories from more than 140 U.S. and Canadian regional business publications. Thousands of stories are added monthly, allowing businesspeople to closely watch competition across the country.
Business Wire	Business Wire	Full-text of news releases from business, industrial, and educational institutions. Updated daily. Electronic delivery of these releases permits users to formulate competitive strategies in response to their competitors' actions.
Claims U.S. Patents Abstracts	IFI/Plenum Data	Data on patents issued by U.S. Patent Office since 1950.
Commerce Business Daily	U.S. Dept. Commerce	Full text from *Commerce Business Daily*. Defense department and commerce department products and services sought and offered. Provides an excellent way to determine the flow of government funds to competitors.

and, because the entire entry is usually searchable, you can conduct research that would be impossible or impractical with printed material. For example, you can search for a keyword anywhere in the title of a book, or for information in a number of special indexes such as audience code or language.

3. You are preparing a report for your company's executive committee on news coverage your firm has received in all major media since the beginning of the year. How can you prepare a comprehensive list and still have the report ready by the end of the day?

Question three is getting to the essence of on-line data retrieval: it is comprehensive and fast. For historical news retrieval you could go to NewsNet, where more than 300 news services, newsletters, and other resources are available on-line. You can also use NewsNet's *Newsflash* service to automatically capture references to your company or any other topic as the data becomes available on-line. McGraw-Hill's *Executive One* news service offers a unique and timely delivery system, with FM broadcast delivery and sophisticated, keyed data capture.

4. Your high-tech company wants to strengthen its visibility at the Department of Defense. You need to find out which products are being sought and the worth of the average contract.

For government contract information, there's *DMS/On-line*, a comprehensive reference of

Table 1. Databases Useful for Competitive Analysis or General Business Research (Continued)

Database	**Producer**	**Focus**
D&B—Dun's Electronic Yellow Pages	Dun's Marketing Services, Dun & Bradstreet	Directory information on 8.5 million businesses, including private and public companies spanning all industries. Of particular use to those involved in mergers and acquisitions since the database is useful for pin-pointing lesser-known, privately held companies, searching by industry code or other criteria.
D&B Million Dollar Directory	Duns Marketing Services, Dun & Bradstreet	Provides a quick look at 160,000 U.S. companies, publicly or privately held, having a net worth of $500,000 or more. Includes details such as gross annual sales, number of employees, and other company information.
DataTimes	DataTimes Corporation	Provides access to regional newspapers including *The Chicago Sun-Times*, *The San Francisco Chronicle*, *The Dallas Morning News*, *The Minneapolis Star and Tribune*, the *AP Newswire*, and *Congressional Quarterly Weekly*.
Disclosure	Disclosure Incorporated	Financial information on companies that is required to be filed quarterly and annually with the Securities and Exchange Commission (SEC).
Dow Jones News	Dow Jones	Up-to-the-minute news on companies, industries, government agencies, and the stock market. This is the same news that's transmitted to Teletype machines in financial services companies across the country. Enables users to retrieve specific news using codes for various industries and stock symbols for individual companies.

Department of Defense contracts, newsletters, market analysis, and budget information. DMS listings even cover such specialized data as major missile installations worldwide. Predicasts' *PTS Defense Markets and Technology* database offers similar information, and the U.S. Department of Commerce offers *Commerce Business Daily*, which announces products or services wanted or offered by the government.

Such on-line data is frequently available from the database producer via a direct dial-up link or through one of the packet networks such as Tymnet. If yours is a fairly narrow and specialized field, this is probably the way to go. If your research covers a broad range of topics you should subscribe to at least one of the database provider services. These include DIALOG, BRS, VU/TEXT, and more general information providers such as CompuServe and GEnie. These database providers, as well as many others, are described in separate reports behind Tab OL20 in Volume 1 of this Directory.

The key to accessing on-line data is to think of your microcomputer as a window opening into a vast world of valuable information. Then identify areas where fast, comprehensive, timely data acquisition would be beneficial. You may have to expend some extra effort educating your company or your supervisor so they will give you access to the services you need and work around any budgeting or billing problems.

Table 1. Databases Useful for Competitive Analysis or General Business Research (Continued)

Database	**Producer**	**Focus**
Dun's Market Identifiers	Dun's Marketing Services, Dun & Bradstreet	Current address, financial, and marketing data on about 2 million U.S. businesses. There are other Duns databases available for financial and business research.
Executive One	McGraw-Hill	Full text, abstracts, and analysis of business news from many printed and electronic sources. Delivered via FM broadcast subcarrier.
Facts on File	Facts on File, Inc.	Full text news articles from selected U.S. newspapers.
Financial Times	Financial Times, Ltd.	Full text of articles published in the London and international editions of the *Financial Times* newspaper.
Harvard Business Review	John Wiley & Sons	Full text, abstracts, and bibliography of the *Harvard Business Review*.
Industry Data Sources	Information Access	Industry-intensive data on 65 major industries. Covers U.S. and Canada. Primarily marketing and financial information.
Investext	Technical Data International	Company and industry reports written by analysts at the nation's leading investment and brokerage houses. Often includes sales and earnings forecasts and other financial data not available from other sources.
Legal Resources Index	Information Access	Lists subject, author, case name, and statute name of information published in over 700 journals. Useful for investigating the legal aspects of any topic.
Management Contents	Information Access	Abstracts and articles covering broad range of business and management topics.

Using On-Line Data for Competitive Analysis

There are more than 4,000 publicly accessible databases. With the proper research, you should be able to find just about any kind of competitive analysis information on one of them—from company size and financial data to information about products and services. This type of information is available through such databases as the *Thomas Register*, *Moody's Corporate Profiles*, *Duns Marketing Services*, *ABI/Inform*, and *Business Dateline*.

More esoteric facts, including information about patents, chemical formulae, legal decisions in a certain field, and agriculture, are also available. Such representative files as Derwent's patent databases, STN's various chemical abstract and other chemical industry databases, *Legal Resource Index*, and *Agricola* specialize in this kind of information. If you need to research a region of the country for sales or marketing information, you probably will need access to U.S. Census Bureau data, telephone directories, real estate information, government installations, and government contracts. *Cendata*, *D&B—Duns Electronic Yellow Pages*, DMS databases, and *INFORM* from Orbit Search provide this kind of information. There are even databases of databases—*Dialindex* on DIALOG, for example—to help narrow your search.

Within these broad subject categories, we can break down the type of information each database contains in several ways. One way to segment the data is by the level of detail provided in each subject area and by how that information is cataloged and presented to the searcher. For the purposes of

Table 1. Databases Useful for Competitive Analysis or General Business Research (Continued)

Database	Producer	Focus
McGraw-Hill News	McGraw-Hill	Current business news from around the world. Updated every 15 minutes.
McGraw-Hill Publications Online	McGraw-Hill	Provides the complete text of such McGraw-Hill publications as *Business Week*, *Byte*, *Aviation Week & Space Technology*, *Chemical Engineering*, and *Securities Week*.
Mergers and Acquisitions	Securities Data Company	Detailed information on both the target and acquirer at the time of a merger or acquisition. Much can be learned from examining the history of either a successful or less-than-successful merger or acquisition.
Moody's Corporate Profiles	Moody's Investors Service	Financial and other information on about 1,300 publicly held companies.
NewsNet	NewsNet, Inc.	Full text news and analysis from newsletters and wire services. Features coverage from more than 350 newsletters.
PROMT	Predicasts	Abstracts of news on industries, companies, products, markets, and technologies. More than 300,000 abstracts are added each year. Sources include daily newspapers and business publications.
Standard & Poors	Standard & Poors Corporation	News coverage and financial reports on more than 9,000 corporations. Includes information covering the prior 10 years.
Thomas Register	Thomas Publishing	Lists of products and background company information. Useful for pin-pointing available products and product manufacturers.
Trade & Industry Index	Information Access	Full text and abstracts from about 1,500 business and industry journals and news releases, PR Newswire, and national newspapers.
UPI News	United Press International	Full text of U.S. news stories carried on United Press International news wire.
Wall Street Journal	Dow Jones	The full text of this leading source of business news, going back to 1984.
World Patents Index	Derwent Publications	Access to nearly 6 million patent documents.

this report we will differentiate between on-line bibliographies and on-line databases. From a usage standpoint you can access the two indiscriminately, combining data from a variety of sources and types to construct the research profile desired. Practically, however, the way the data is organized can affect which repository you should access and the search techniques you will use once connected to that source.

Bibliographic databases include *Business Dateline* and *ABI/Inform* from UMI/Data Courier, the *Computer Database* and the *Magazine Index* from Information Access Company, *PROMT* from Predicasts, and the *Harvard Business Review.* These databases, and hundreds more like them, offer abstracts and full-text copies of articles from major national and international magazines, newsletters, news wires, and newspapers.

Bibliographic files generally include searchable fields such as publication name, date, author, or subject. In addition, you can search the full text of the abstract or article for keywords or phrases. Traditional databases include Dun and Bradstreet's *Million Dollar Directory*, *Moody's Corporate Profiles*, *The Thomas Register*, and *D&B—Duns Electronic Yellow Pages*. These databases include data in a fielded format and are generally written and produced by the provider, rather than abstracts or full-text copies of previously published material. Table 1 describes representative databases useful for competitive analysis or general business research. For in-depth descriptions of these databases, consult the On-line Databases section (Tab OL40) of this Directory.

Choosing from What's Available

One of the most difficult things about using on-line information resources is deciding which of the thousands of databases best suits the current research requirements. The easiest (but most expensive) way to gain proficiency in selecting databases is to simply use them. As you experiment with finding information electronically you will settle on a core of databases that seem to fill most of your needs most of the time. Even professional researchers settle on a score or so of databases that they have found, through years of experience, to meet their needs most of the time.

Luckily, there are third-party companies that collect hundreds of database offerings together in one place so you can log on to one source and have access to many resources at once. DIALOG is one such provider of databases. Others are BRS, VU/TEXT, IQuest (CompuServe), and Dow Jones News/Retrieval.

One key to successful searching is to think broadly in the initial stages of the project. Many on-line searchers fail to consider the extremely broad range of information that is available on-line. And, because thousands—even millions—of records can be searched in a few seconds, it is possible to try research strategies that would be impractical, and sometimes impossible, to do manually.

Sample Search Strategies

In today's fast-paced business climate, decision makers need to know everything about the environment in which their companies function. They need this information to maintain market share, to expand their share, to enter new markets, or to introduce new products or services. Often called corporate or competitive intelligence, such information provides the raw data and the basis on which subsequent analysis can be performed—and informed business decisions made.

There is no shortage of on-line information available for competitive analysis. In fact, the true power of using on-line information is unleashed when a searcher sorts through mountains of it to find what is valuable and can be turned into business opportunities or competitive advantage. Since individuals who perform different business functions need different kinds of information, the challenge is always to provide the proper level of detail for the right individual.

Often, large companies, recognizing the importance of competitive or corporate intelligence to their executives, create their own abstracted reports of their industry and their competition. Often these daily executive updates are gleaned from several on-line sources, sometimes formatted into a concise and easily read report, and disseminated to key employees via an in-house electronic mail. Other times this corporate intelligence is done on an as-needed basis.

Using Databases for Current Awareness

Keeping up with news on an industry, specific company, or top personnel is a critical part of corporate intelligence. Certainly many business people personally read the numerous business publications—from national dailies to weekly business magazines and the more specialized trade newspapers that cover their specific industry.

Too often, though, time demands on executives are so great that they need a systematized way to be assured they are seeing all the news and information they need to see. One way this is accomplished is through reading abstracts of information from on-line services.

Some on-line services, in fact, provide what is known as an executive clipping service. Clipping services are user interfaces that retrieve information from a variety of databases in categories the individual has predetermined to be important. The information is presented in an easily and quickly digested form.

No matter the final format, electronic sources are among the fastest and most efficient means for gathering news for competitive intelligence and analysis.

It often is more time efficient for an assistant to electronically search the metropolitan papers of the cities where key competitors are headquartered, than for an executive to wade through several voluminous papers. Company news, either positive or negative, is most likely picked up by the local media and, while important from a competitive standpoint, may not make any national or even trade publications. For instance, news that a company is having difficulty with local zoning or environmental issues relative to a plant expansion would certainly make the local daily, but unless it represents a larger issue, would not warrant national media coverage.

Looking at the Financials of Competitors

Companies large and small need information on which to base their financial decisions—whether to buy a large portion of another company, propose a merger, or fend off an unwanted takeover. More and more, today, companies that need information fast turn to on-line sources.

Stock Quotes

Stock quotes, available from many on-line providers, are a must for many executives' corporate intelligence. How a competitor's stock moves in reaction to industry news, economic news, and the stock market in general, can be analyzed daily and conclusions drawn regarding that competitor's strength and weakness.

Evaluating On-Line Information

As the volume of information available increases, a new problem surfaces. It can be difficult to evaluate and understand the significance of the large amounts of data you find.

PC software that helps you manipulate information once it has been retrieved from the master database is becoming popular. For example, Personal Bibliographic Services (PBS) and the Institute for Scientific Information (ISI) offer database management packages specially designed to handle the data records that come from DIALOG, BRS, and other on-line providers. As you conduct various searches, the captured information is loaded into a local database for further analysis and reports. This local database information can be output in recognized literary bibliography style. Spreadsheet-type reports, including summaries, and mathematical operations can also be produced. Some postprocess packages, such as Derwent's PatStat for studying patent information, can produce color graphs to aid in data analysis.

There are also full-text database processing packages to help you handle the free text information captured from databases. Some of these retain or create searchable fielded information; others treat the whole record as free text. The most versatile of these text managers import data from your downloaded text files.

Summary

On-line database searching is a rapidly growing field that is destined to touch information professionals, business managers, project leaders—virtually anyone involved with finding and using information. Providers of on-line data are increasing the information they make available to subscribers, and the number of users who access data electronically is rapidly rising. DIALOG Information Services, for example, had only about 80 subscribers in 1977. By 1989, the number had grown to more than 115,000 users. CompuServe reports it had 1,200 subscribers in 1979; today there are more than 550,000 members, with as many as 7,000 new users signing up each month.

One of the changes that is occurring as these numbers grow is a trend toward end-user searching. Only a few years ago, most on-line research was conducted by information professionals. While information professionals still amass more on-line hours than end users, end users are catching up.

These trends show that more than ever professionals need to educate themselves on what on-line services offer. One of the best ways to do that is to sign up for a service and start using it. Searching gets easier with experience, and once you are accustomed to finding information electronically you soon will understand just why the on-line industry is growing the way it is. ■

Using On-Line Databases for Market Research

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This report will help you to:

- Recognize the advantages of computer-accessible databases for market intelligence.
- Identify the myriad types of on-line information resources that can help businesses succeed in the marketplace.
- Understand "selective dissemination of information" as a method of selecting key information on specific topics.

Synopsis

Information is the key to success in any business endeavor. Effective marketing relies on both timely and concise information. On-line resources can help with all aspects of business and, in marketing, are the best way to keep your finger on the pulse of whatever industry you are exploring.

We base our decisions on knowledge and information. Collecting relevant information is, perhaps, the most important step in the decision-making process. With an increasingly competitive and fast-paced business environment, identifying the information needed to face these challenges is difficult. Timely and reliable information about current market conditions is a source of power that can help a company outperform its competitors. Business constantly demands new information to help analyze the challenges and make the decisions that will provide the competitive edge. Today, it is more important than ever for businesses to obtain timely and correct information for effective decision making.

Our society, however, suffers from "information overload." We know that key information is available, but determining the right source among the hundreds that exist is often difficult. Or, once we identify the appropriate information source, obtaining the needed information is difficult.

This report was prepared exclusively for Datapro by Ronald G. Albright, Jr., M.D. Dr. Albright is a practicing physician who has been widely published in both the lay and medical press on the applications of computers in medicine. He has spoken to numerous national and regional societies on applying computers to patient care and information access. He is the author of "A Basic Guide to Online Information Resources for Health Care Professionals" (Information Resources Press, Arlington, VA).

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Businesses need more than a way to quickly locate relevant facts and figures, the latest news, and expert opinions. Today there is a need to access a variety of business information from an assortment of current and reliable sources.

Huge quantities of information have existed in printed form for years. Previously, only major corporations that could commit sufficient personnel to sifting and digesting this printed material could use much of this information. But microcomputers and on-line databases, which reduce printed matter to a series of invisible electronic impulses stored on disks, have changed this situation. And, because the information is indexed, it can now be searched in ways that were impossible in printed form.

Realizing that electronic publishing has opened new markets for their information products, the world's leading magazine and newsletter publishers have capitalized on these developments. They have produced computer-searchable versions of their printed products and made them available for on-line retrieval. The expansion continues but, already, it is difficult to imagine a printed publication that is not referenced, somewhere, electronically.

Another sidelight of the explosion in electronic resources is the shift in information control. Small companies, using sophisticated but cheap computers, modems, and ordinary phone lines, now have the same information power as the largest firms. Electronic information access has empowered these companies to be competitive in an increasingly information-intensive business world.

Electronic market research through on-line databases brings increased knowledge of consumers, customers, and the marketplace to businesses of all sizes. In turn, this electronic information access minimizes the risk of doing business and increases profit-making potential.

The Flexibility of Electronic Information Retrieval

As mentioned, electronic information can be coded and stored in ways that are not feasible for printed matter. Text source material, for example, can be presented as bibliographic (with an abstract attached), reference (citation only), or in full text. The on-line medium adds additional flexibility to information. Researchers can sort and combine files in ways that let them test "what if" relationships. And, unlike printed material, electronic databases can be updated monthly or even daily. In the case of stock reports and news wires, updating is done even more often. Researchers can retrieve relevant and precise information, in abstract or full-text form, in a minimum amount of time.

Additional flexibility is intrinsic to electronically acquired information in that it allows manipulation of the information once retrieved. Information from electronic databases can be printed or displayed at the terminal or captured (downloaded) and stored on a diskette. Once captured, it can be loaded into word processors for editing, databases for mass mailings, or spreadsheets for further manipulation. The process of searching on-line databases is not static. Once a magazine or newsletter is produced, mailed, and read, the information process is complete. With electronic publishing, placing the information on-line only initiates the journey.

Researchers in any field can now choose from a variety of database vendors. There are on-line databases on such diverse topics as corporate intelligence, industry trends, market segments, consumer patterns, and scientific and technical research. Researchers can tap into publications, databases, and indexes spanning business, government, research, news, and even popular entertainment and sports.

Why Use Databases for Market Research?

In addition to the flexibility electronic information retrieval offers, there are other reasons for using on-line databases for market research tasks:

- You save time. You can pinpoint specific information from the "information flood" at any time. Rather than wade through page after page of irrelevant information, you can retrieve answers to specific questions and problems quickly and get complete articles or reports on-line within minutes.
- When used efficiently, it can be cost effective. You pay only for the time that you are connected to the computer and for the information you obtain. Electronic information retrieval is more expensive, in dollars, than manual research, but costs must be weighed against the value of your time.

- Information retrieval is increasingly simple and supported by a large array of communication tools. New "front-end" menu systems reduce the learning burden for new database users. Further, most large systems offer extensive 24-hour customer service to help users.

Specific Applications

There are well over 250 million items available through on-line databases, spanning virtually every subject. To illustrate how on-line databases can be used for market research, we will consider some specific applications.

Demographic On-Line Resources

A wealth of demographic information is available on-line. We will examine three sources that are good examples of what is available.

U.S. Census Bureau Data

The Bureau of the Census is by far the largest publisher of comprehensive statistical data. The Census Bureau prints only its most widely used censuses and surveys. Much more information is available, usually on computer tapes. Many companies now use U.S. Census Bureau data when researching particular industries or target areas. We will look at some examples of the type of information that is available and discuss how a researcher might use the data to determine sales potential.

Generally, the first step is to select the search criteria. For example, when using demographic data a researcher might specify a particular geographic area. This is done by specifying zip code, county, state, metropolitan area, census tract, place ADI (an Arbitron TV market segment), DMA (a Nielsen TV market segment), Minor Civil Division (MCD), or the entire United States. Reports are available for any group or subset of groups within these categories.

A business-to-business report might include information on specific business patterns broken out by Standard Industrial Classification (SIC) categories. Each report might break down the total number of businesses for each specified geographical unit by company size. Information is usually indexed so an observer can easily spot trends in terms of penetration or other criteria. Additional information might also be available for business and industry purchasing trends over time.

Using pure census data, we could examine a variety of economic indicators over time. Some examples of the time series data that could be captured are GNP, money supply, personal income, the index of leading indicators, and index of industrial production.

Looking at demographic indicators, we can retrieve information on population distribution in a particular area by age, households, education, income, ethnic background, marriages, or births.

For a marketer that is considering expanding into a new territory or introducing a new product line, the demographic information based on U.S. Census data that is available can be invaluable. Business expansion can be strategic with this kind of readily available input.

ACORN

One of the most important on-line databases for market researchers is *ACORN* (A Classification of Residential Neighborhoods), produced by CACI, Inc. of Fairfax, VA.

ACORN is a state-of-the art market segmentation and target marketing tool. It is based on the premise that people who share similar demographic, socioeconomic, and housing characteristics live in similar neighborhoods. As a result, they have similar shipping patterns and share similarities in the media they read, listen to, or watch. In addition, they may respond similarly to promotions and direct marketing programs. The statistical technique is known as cluster analysis.

There are approximately 260,000 neighborhood block groups (each containing, on the average, 340 households) in the U.S. *ACORN* uses 49 variables to classify each of these into 44 distinct, homogeneous market segments or "Lifestyle Clusters," based on each neighborhood's characteristics. These clusters each have a separate profile. You could get a comparison of the *ACORN* profile of your area and any other area.

Some examples of *ACORN* clusters follow. Remember, however, that the descriptors are simply titles attached to an area. (A user's manual is available that provides details on using the database for market research.) Some clusters are Newer Suburbs, Young Families-High Mobility, Older Population-Ethnic Mix, Seasonal Housing, Poor Families-High Unemployment, Highrise Areas, and Upper-Mid Income with High Rent/Value Condominiums. A look at just these few clusters would help market researchers decide whether to include or exclude a specific population depending on the product marketed.

The *ACORN* system can also be used, on a project basis, to analyze customer lists. Every household, survey respondent, sales record, warranty card, credit card, or customer can be classified into its respective market segment from its address. If you lack lists, CACI can profile customers for thousands of products and services by using existing surveys of hundreds and thousands of consumers. Whatever the source, once you have a profile, these services can help you find customers who match it.

ACORN is also linked to direct mail lists and syndicated product and media databases. Market potential reports based on these product and media surveys are available. Links to direct mail are handled by CACI. *ACORN* can give you the big picture on your customer base by telling you who your target market segments are, where they live, and how to reach them effectively and efficiently. Table 1 (Demographic Forecast Report) is an example of a report available from CACI. It is for a hypothetical market in central Ohio. For a complete description of designing better marketing efforts, contact CACI at (703) 218-4419. *ACORN* User's Guides are available for $5 each.

SUPERSITE

SUPERSITE is an on-line database that links the utility of *ACORN* with some of the largest and most current consumer data available from the Mediamark Research Survey (MRI) and the Gallup Convenience Store Customer database. This combination provides additional power when developing market potential information.

With *SUPERSITE*, a researcher can evaluate indexes of potential demand for services, estimates of expected number of patrons or customers, and/or estimates of expected sales volumes. *SUPERSITE* makes available reports for financial services, investment services, convenience stores (see Table 2), restaurants, shopping centers, medical/health insurance, advertising/media, the automotive aftermarket, and consumer electronics. Expansion plans are in place for more of these types of reports, especially in conjunction with the thousands of products and services covered by the MRI survey.

You might request a sample *SUPERSITE* report to explore, for example, the retail market potential for photographic film development. Your report would include general information on the population and market potential for the geographic area selected. It would also provide expenditure data to estimate how much money people in that area spend for photographic film and development. It would index the relative sales potential of the defined area with the economic region in which it is located. It would also provide a market growth index that measures the relative growth rate in sales potential of the defined area.

Or, a researcher could select one zip code or any other geographic designation and retrieve a complete demographic and psychographic profile of the area. This would include breakdowns for basic characteristics such as age, occupation, household income, race, types of households, and average home value. One could also look at the sports and leisure activities of the specified area. The likelihood that people in the specified area golf, play tennis, hunt, or jog could be determined, as could their propensity to gamble, attend the theatre, do crossword puzzles, rent videotapes, entertain at home, and travel.

For consumer information services, the information could provide gift ideas, indicating, for example, whether a person from that area would like to receive a given gift. Marketers would turn this information around to determine whether their particular product line would appeal to the demographic area since all the data is based on past buying behavior. This information can be detailed. We provide a few examples here to show the variety and depth of information that can be captured: jazz music albums, travel magazines, hiking and camping boots, stocks, educational toys, golf clubs, attaché cases, and sweaters.

The areas covered here give just a glimpse of the market research information available on-line. Whether you want to eliminate off-target market segments or to expand in a particular area or market niche, these databases provide the tools to help you more accurately assess the full business potential of your plans.

Table 1. Supersite Demographic Forecast Report

SAMPLE SUPERSITE REPORT

AREA REFERENCE:
CENTRAL OHIO ZIPCODE

COPYRIGHT 1989 CACI, FAIRFAX, VA

INCLUSION/EXCLUSION

	1980 CENSUS	1989 UPDATE	1994 FORECAST	1989-1994 CHANGE	ANNUAL GROWTH
POPULATION	22422	21166	20102	−1064	−1.0%
HOUSEHOLDS	9123	9040	8848	−192	−0.4%
FAMILIES	6666	6391	6120	−271	−0.9%
AVG HH SIZE	2.45	2.33	2.26	−0.07	−0.6%
AVG FAM SIZE	2.93	2.84	2.78	−0.06	−0.4%
TOT INC (MIL$)	272.8	393.4	415.0	21.7	1.1%
PER CAPITA INC	$ 12165	$ 18585	$ 20647	$ 2062	2.1%
AVG FAM INC	$ 34041	$ 49167	$ 52935	$ 3768	1.5%
MEDIAN FAM INC	$ 30064	$ 47290	$ 52352	$ 5062	2.1%
AVG HH INC	$ 29899	$ 58043	$ 46906	$ −11137	−4.2%
MEDIAN HH INC	$ 25879	$ 40870	$ 44686	$ 3816	1.8%

	1980 CENSUS	%	1989 UPDATE	%	1994 FORECAST	%
HOUSEHOLD INCOME						
$ 0- 9999	1145	12.6	460	5.1	393	4.4
$ 10000-14999	1048	11.5	574	6.3	478	5.4
$ 15000-24999	2179	23.9	1352	15.0	1180	13.3
$ 25000-34999	1915	21.0	1387	15.3	1195	13.5
$ 35000-49999	1660	18.2	1909	21.1	1825	20.6
$ 50000-74999	720	7.9	1972	21.8	1836	20.7
$ 75000 UP	456	5.0	1386	15.3	1942	21.9
AGE DISTRIBUTION						
0-4	1168	5.2	1085	5.1	1065	5.3
5-11	1852	8.3	1523	7.2	1456	7.2
12-16	1643	7.3	1252	5.9	1087	5.4
17-21	1399	6.2	1378	6.5	1142	5.7
22-29	2413	10.8	2270	10.7	2201	10.9
30-44	4590	20.5	4558	21.5	4124	20.5
45-54	2725	12.2	2442	11.5	2715	13.5
55-64	2982	13.3	2594	12.3	2194	10.9
65+	3650	16.3	4064	19.2	4117	20.5
AVERAGE AGE	39.7		41.7		42.4	
MEDIAN AGE	38.2		40.1		41.3	
RACE DISTRIBUTION						
WHITE	22041	98.3	20769	98.1	19686	97.9
BLACK	79	0.4	86	0.4	93	0.5
OTHER	302	1.3	311	1.5	323	1.6

Table 2. Supersite Convenience Store Market Potential Report

SAMPLE SUPERSITE REPORT

AREA REFERENCE:
CENTRAL OHIO ZIPCODE

INCLUSION/EXCLUSION

COPYRIGHT 1989 CACI, FAIRFAX, VA

	1980 CENSUS	1989 UPDATE	ANNUAL CHANGE
POPULATION	22422	21166	−1.15%
HOUSEHOLDS	9123	9040	−0.18%

C-STORE CUSTOMER VISITS PER DAY* 3165

SHOPPING FREQ. INDEX (AVERAGE=100)	
ALMOST EVERY DAY	98
2-3 TIMES PER WK.	102
ONCE A WEEK	99
2-3 TIMES PER MO.	103

	PRODUCT POTENTIAL INDEX (AVERAGE=100)	C-STORE CUSTOMER PURCHASES PER DAY*
MILK	97	706
BREAD/CUPCAKES	84	456
SOFT DRINKS	97	550
CIGARETTES	104	487
NEWSPAPERS/MAG	101	363
MEAT/SANDWICH	67	143
SNACK FOOD	90	208
DAIRY PRODUCTS	91	152
FOOD/GROCERY	130	193
PRODUCE	94	172
CANNED GOODS	84	111
BEAUTY/HAIRCARE	91	121
CONFECTIONARY	86	122
ICE CREAM	107	81
KITCHEN SUPPLY	77	117
HOUSEHOLD ITEM	102	110

C-STORE FAST FOOD

CUSTOMERS/DAY* 430

C-STORE FAST FOOD PRODUCT POTENTIAL INDEX (AVERAGE=100)	
SANDWICHES	97
BEVERAGES	105
HAMBURGERS	70
FRIED CHICKEN	87
PIZZA	97
HOT DOGS	86
MICROWAVE ENTREE	84

SOURCE: CACI; THE GALLUP CONVENIENCE STORE CUSTOMER DATABASE DEVELOPED FROM MONTHLY TELEPHONE INTERVIEWS CONDUCTED WITH A NATIONALLY REPRESENTATIVE SAMPLE OF ADULTS AGED 18 AND OVER (1978 TO PRESENT). ALL INDEXES ARE CALCULATED BASED ON THE PERCENT LIKELY TO PURCHASE A PARTICULAR PRODUCT CATEGORY OR SHOP WITH THE SPECIFIED FREQUENCY COMPARED TO THE AVERAGE FOR THE PARTICULAR REGION. NOTE: REGION SELECTED FOR THIS REPORT IS ENTIRE U.S.

On-Line Financial Resources

There is also a wealth of financial information available on-line. Not only can you track stock, company, and issue performance; you can also take advantage of news clipping resources to follow any industry, company, or subject that relates to your business' operation and growth strategy.

Simple stock monitoring is available through many on-line databases. A searcher can focus on the latest price, recent high and low prices, capitalization, risk, and industry. Many on-line services such as CompuServe and Dow Jones News/ Retrieval provide quotes with a 20-minute time delay for over 9,000 stocks traded on major U.S. exchanges. (The reason for the delay is that this is the earliest point after a trade that information can be available without a mandatory subscription charge for the data.) Reporting is done twice per day on over-the-counter activity. It is possible to track the stock market with up-to-the-minute tracking through a variety of subscription services. Of course, no-load mutual funds, bonds, options, and futures can also be analyzed.

Fundamental analysis of company performance using economic and industry-based factors is also available through many sources. One can tap the most recently reported financial information on each company or focus on financial strength, return and growth ratios, and cash flow. Some of the better-known financial on-line sources available are found in Table 3.

You can access these, or many other on-line financial resources, to study corporate data, monitor market position, or conduct technical analyses by using a variety of analyses and utility programs.

On-Line News Resources

Many of us are familiar with news wires, which feed subscribing newspapers and broadcast media the latest news. These rapidly developing stories are then "digested" by the news staff and made available to the public hours or days later. For a growing business—where keeping abreast of industry happenings, competitive growth, legislative issues, or market trends may mean the difference between taking the lead or being an also-ran—these delayed sources may not be sufficient. Further, in the process of readying these stories, specific details you need may be cut out for the sake of space or time. The small detail cut to save 15 seconds of airtime or a column inch of newsprint may mean all the difference to a business.

Business can tap directly into these news services on-line. The complete stories are accessible so that details are not left on the cutting-room floor. Even beyond this capability, news services on-line offer great enhancements over tracking stories in "secondhand" media. There have been some interesting developments in the on-line arena that combine the breadth and timeliness of news services with the search capabilities of computers.

These electronic news clipping and retrieval services allow the professional to designate sources to be monitored and issues to be tracked. On-line clipping folders gather stories of interest as soon as they come across the designated news wires. You supply "key words" or "key phrases" that define specific areas of interest. Stories are searched for these key phrases as the stories are transmitted. If the phrases are found in a story, the story is "clipped" and held in an on-line "folder" for your review. The process is called "selective dissemination of information" or "SDI."

Choosing the right search phrases is crucial. Phrases that are too general generate unwanted stories, while phrases that are too narrow may screen out pertinent stories. Since devising effective keyword searches underlies most on-line market research, it is important to understand the basics of how to construct effective searches.

For example, suppose we want to do a search on the phrase APPLE COMPUTERS. This phrase will only clip stories that have the words APPLE and COMPUTERS next to each other—this is too narrow. Yet, specifying just APPLE or just COMPUTERS would be too broad. Entering APPLE + COMPUTERS is a better phrase since the words can appear anywhere in the story (not necessarily next to each other). Further designators can be used to make the phrase better still. APPLE + *COMPUT* would find stories with APPLE and COMPUTERS, or APPLE and MICROCOMPUTER, or APPLE and COMPUTING, etc. This is because the * represents a wild card designator (systems vary as to what is used as a wild card), and any prefix or suffix could stand in its place.

Keywords or phrases can be just one word or multiple phrases. They are combined in a string, but scanning will uncover stories or articles that contain both phrases, although they are not necessarily next to each other. One example might be FEDERAL RESERVE + INTEREST RATE*. These two phrases will now act as filters when scanning wire sources or searching on-line databases that store reference material. The process of stringing together search phrases is called concatenation. Proper concatenation is the foundation of an effective search strategy.

While establishing the appropriate search phrases is important, it is also important to specify pertinent news wire sources to be searched. Consumer information services offer such standard sources as the Associated Press U.S. and World Wires, Reuters Financial Report, OTC NewsAlert, and *The Washington Post*.

In constructing a search, any or all of the news wire sources can be selected for inclusion. Business and professional information sources provide more in-depth coverage of specific industries.

These sources include specific publications, reference materials, newsletters, and reports.

The advantage of using on-line news databases for market research should not be minimized. In a fast-paced world, it is important to keep up to date on a variety of issues and occurrences without falling prey to an information avalanche. The ability to tap into on-line databases to retrieve the pertinent information when it is needed can be invaluable.

On-Line Business, Industry, and Corporate Resources

On-line information is available from a variety of widely recognized publishers, government agencies, corporations, and associations. Several databases that are helpful tools for ongoing business research and operations are listed in Table 4.

The databases mentioned in Table 4 are general business files that have broad applications over a variety of industries and product lines. It is not possible within this report to do justice to the variety and scope of information that is available, other than to point to just some of the applications and products available to businesses and corporations.

In addition to the general databases profiled, there are hundreds of industry-specific databases that cover areas such as chemistry, medicine and the biosciences, law, government, intellectual property, science and technology, energy, education, reference, humanities, and the social sciences. These databases are available on-line through a variety of service providers.

Market Research in a Live Environment

While this report generally deals with market research information and data that is available through on-line databases, it is also possible to interact with consumers or business prospects in an on-line environment.

There are public—such as CompuServe or GEnie—and private services and local bulletin boards where consumers meet through their computers and phone lines to access a variety of services. Through these forums, modern marketers can conduct on-line product testing. A company might post information about a product or service and invite comments or even host an on-line discussion of the uses and benefits of the product. While this will not be a viable approach for every business line, it does offer a unique opportunity to sample groups of experts or consumers.

It is also possible to conduct on-line surveys. Again, this can be done with selected special interest groups or with a broader on-line population. Several companies (as expected, mainly in computer-related industries) have begun to see the value of this type of data as an addition to their normal market research activities. Companies such as Ashton-Tate, MicroSoft, and Lotus all maintain an "on-line presence." They have begun forward planning to develop enhanced on-line systems to collect data and also to forge relationships with on-line service providers that reach a broad spectrum of the on-line population.

The use of on-line sampling and market surveying is in its infancy. But it is important for planners to recognize that, with the increasing number of modem-equipped computers in the home and office, this type of research may provide an important source of market information in the future.

On-Line Databases in the Direct Marketing Environment

In discussing specific applications, we touched on how on-line databases relate to direct marketing. But it may be helpful to put this in perspective and describe the use of on-line databases for specific business planning and growth applications.

New Business Development

On-line databases can be invaluable in planning a new product introduction or significant business expansion. When used properly, they can help with market penetration assessment, market segmentation, potential for growth, development of a marketing plan, and other activities.

The first step after deciding to use databases for market research is to investigate some of the demographic and business databases available. This can help you assess the product or business line for viability before you take it to market.

There are some other resources available to help you develop a marketing plan. An intelligent look at space media might include a search of Adtrack, which follows advertisements in over 150

Table 3. Databases Useful for Financial Analysis

Database	**Focus**
Disclosure	Includes financial statements and rations, business segment data, a business description, management discussion, and important business developments for over 12,000 companies. The database is built from U.S. Securities and Exchange Commission (SEC) filings and annual reports. These reports provide extracts of 10-K, 10-Q, and 20-F financial reports.
Disclosure/Spectrum	Lists insider owners, institutional owners, and owners of 5 percent or more of a company's stock. Covering over 5,500 companies, it is built from Disclosure II and three publications from Computer Directions Advisors; Spectrum 3 (institutional holdings), Spectrum 5 (5% ownership holdings), and Spectrum 6 (ownership by insiders).
Value Line	Provides annual and quarterly financial statements including key ratios along with sources and uses of funds for over 1,800 firms.
Value Line Forecasts	Provides perspectives and guidance on periods for three to five years in the future, including share, earning, dividend, price, and other forecasts for over 1,800 major U.S. and Canadian companies.
Institutional Brokers' Estimate System (I/B/E/S)	Presents the forecast earnings and growth consensus of over 2,500 professional securities analysis, from 130 brokerage and research firms for over 3,400 companies. The degree to which these investors concur and the range of differeing opinions offer clues to potential price movement.
Standard & Poor's	The equivalent of Standard & Poor's Corporate Records, several databases are available. The "*Corporate Descriptions*" database gives corporate background and financial statements for over 12,00 publicly held U.S. corporations. The "*S&P's News*" provides recent information on more than 10,000 companies, covering interim earnings, management changes, contract awardings, litigation, and officers. S&P's "*Register*" offers information on over 70,000 key corporate executives ("Biographical") and corporate information ("Corporate") on over 45,000 companies with sales over $1 million.
Company Intelligence	This database contains news references culled from other databases and incorporates them into records for over 90,000 companies. Since it emphasizes privately held firms, it provides one-stop access to corporate information from several news sources.

major consumer and business publications. It covers every ad of a quarter page or larger. Users can quickly determine which companies advertise in any of nearly 3,000 product categories. A direct marketer can track by product name, company name, and product message.

Mailing lists are often the lifeblood of a marketing plan, and CCX now offers the SRDS Direct Mail List Identification System as an on-line database. Most list brokers now use this source to recommend specific mailing lists for use in direct marketing campaigns.

D&B-Dun's Electronic Yellow Pages is a series of eight databases culled from the yellow page directories in over 4,800 United States cities and other specialized directories. These databases include Financial Services, Professionals, Directory of Education, Construction, Manufacturers, Retailers, Services Directory, and Wholesalers. Direct marketers can search, sort, and retrieve information for any requirement. These databases can be used to generate mailing lists by using selection variables such as a modified four-digit SIC code, zip code, or phone number.

CCX also offers the ability to control the merge/purge process while on-line. By connecting with the CCX host computer, a marketer can now monitor the progress of list conversion activity, set the appropriate parameters and priorities for merge/purge processing, and perform whatever splits are needed for test panels. All the major processing houses may soon use this technology.

Refining Your Current Marketing Activities

With mailing costs continually increasing, direct marketers are always looking for ways to gain efficiencies in every stage of the marketing process. On-line databases can help.

Zip code, life-style indicators, and other demographic overlays can help you refine a marketing plan. Many of the demographic resources previously mentioned can enhance these efforts.

Table 4. Databases Useful for Business Research

Database	Focus
Dun & Bradstreet—Dun's Market Identifiers	a directory that contains over 2,000,000 public and private companies with 10 or more employees, listing address, products, sales executives, corporate organization, and subsidiaries.
Dun & Bradstreet—Dun's Financial Records	contains financial information, complete spreadsheet analysis, industry comparisons, company history, and operations information on over 700,000 U.S. business establishments. Credit and financial departments interested in payment histories often use this database.
TRW Credit Data	provides consumer credit information to bona fide credit grantors with a legitimate business need for the information.
TRADEMARKSCAN	from Thompson & Thompson, now exists in both a Federal version (covering over 800,000 currently active Federal filings with the U.S. Patent and Trademark Office) and State (for trademarks registered with the Secretary of State of all 50 states). A recent addition, addressing the Trademark Law Revision Act of 1988, is that both databases now include "Intent To Use" filings.
Predicasts Annual Reports Abstracts (PTSA)	is a company-specific database of over 3,000 companies offering product line information from a statistical and textual description viewpoint. Textual abstracts detail corporate structure, products, applications, market shares, strategies, and facility-related information.
Frost & Sullivan Market Research Reports (FSIS)	describes reports detailing specific products or industries in terms of product end users, market size, market distribution, and emerging trends.
Commerce Business Daily	is the definitive source of notices from the U.S. Department of Commerce for government procurement invitations, contract awards, surplus sales, and R&D requests. This file is useful for competitive tracking and purchasing and sales leads. The file is the full-text version of the printed publication by the same name and is updated daily.

Another useful on-line database is Donnelley Marketing's *ClusterPlus.* This features 47 different demographic clusters, each representing a distinct consumer life-style pattern and offering a sound basis for assessing product behavior. The nucleus of the ClusterPlus system is a file containing cluster descriptions of every block group/enumeration district in the United States.

This information can be used in regression analyses to help you better understand your customer base and model your customer profile. Once you have a firm understanding of who your customer is, you can develop screening tools to help you effectively penetrate the market. Many mailers now apply selected zip tapes developed from their own customer experience. These tapes allow the mailers to select from potential mailing lists those prospects who have a greater likelihood of responding to the mailing offers.

Names with poor potential can be eliminated, segmented, or otherwise restricted. Names with above-average potential can be given preferential treatment or special offers or they can be remailed.

On-line databases can also help in screening for new customers. Metromail has developed an Online Address Information System. It allows a direct marketer to tap into the National Consumer Database of 106,000,000 individuals in 65,000,000 households and instantly verify pertinent information on requests or applications. Neighbors of customers can be retrieved for investigative or marketing purposes. It also provides change of address information and individual household profiles such as exact age, dwelling type, names and ages of family members, and length of residence.

Availability of On-Line Databases

The company that decides to take advantage of on-line databases has three general options for tapping them. There are business information services, consumer information services, and some industry-specific services.

Business Information Services

Information services continue to grow both in terms of subscriber count and usage. Due to new simple, menu-driven interfaces, end users can now feel comfortable using these services. In addition, the number of full-text databases available is growing rapidly. No longer confined to "bibcit" ("bibliographic citations") or abstract-only databases, full-text services allow for more complete research.

For general market research there are two major information providers that cover a good deal of the information available. DIALOG Information Services (Palo Alto, CA) is the largest provider and offers more than 350 databases covering numerous subject areas. Its over 200 million records cover all areas of science, technology, business, medicine, social science, current affairs, and news and humanities.

BRS Information Technologies

BRS Information Technologies, a division of Maxwell Online, offers over 60,000 subscribers access to more than 150 databases encompassing the following disciplines: the biosciences, medicine, health, education, business and finance, technology, the social sciences, the humanities, and general reference. The company is best known for its medical-, science-, and education-related files and the quality of its customer support function and search software.

These two major players have other competitors. Mead Data Central (Dayton, OH), for example, specializes in full-text information and has more than 200,000 subscribers. Its most popular services are LEXIS, an on-line legal information service, and NEXIS, consisting of more than 160 business, financial, technical, and news magazines, newspapers, newsletters, and wire services. There are also many other business services suppliers that are narrower in focus and smaller in size.

Consumer Information Services

There are two visible trends in the consumer information industry. First, there is the increasing availability of "hard-core" business information on the general information utilities. This change is a result of the increasing competition in the consumer information industry. Services such as CompuServe and GEnie, once havens for computer hobbyists, now provide many of the business services once found only in services for information professionals and businesspeople. Second, like the pure information services, the enhancement of the user accessibility through improved user interfaces has eased the learning curve for effective system use.

There are two major companies that service most of the market, but there are several other aggressive companies also in the field.

Dow Jones News/Retrieval (Princeton, NJ) provides over 300,000 subscribers with business, financial, and general news via numerous proprietary and nonproprietary databases. It ranks as one of the most respected and successful on-line information suppliers of business information. As one would expect from the publishers of *The Wall Street Journal*, there is a great deal of securities and business information.

The CompuServe Information Service

Based in Columbus, OH, CompuServe provides 565,000 subscribers access to more than 400 business, consumer, and entertainment offerings. It has been the leader in general information utilities since 1989 when it acquired The Source. CompuServe's business services, enhanced over the past couple of years, include in-depth databases for financial analysis, decision support, and database management. Major research services include the "IQuest" service which provides a gateway to over 900 databases, an active SDI service through its "Executive News Service," and full access to *ACORN* and SUPERSITE services.

GEnie

The General Electric Network for Information Exchange, based in Rockville, MD, is among the newer players in the consumer information industry. Its services, more limited than Dow Jones' and CompuServe's, are growing rapidly.

Industry Sources

Within the direct marketing industry, in particular, there are also on-line databases available for market research. A few of them were mentioned previously, but there are others. Businesses that are interested in additional sources should contact the Direct Marketing Association (DMA), 6 E. 43rd Street, New York, NY. Telephone (212) 689-4977. DMA attempts to maintain up-to-date files on the variety of available services; this directory can also be of help. Consult the appropriate headings in the Subject Index to pinpoint additional relevant databases.

The CD-ROM Option

An alternative to on-line information retrieval is CD-ROM technology. This medium, which allows the storage of 650 megabytes on a single disk, can handle all but the largest databases. The disks are cheap to produce and can be searched directly from a personal computer, obviating the need for a modem and telephone line. The prices of the drives needed to read CD-ROMs are falling, and the number of databases on CD-ROM is increasing. Therefore, CD-ROM is now a viable alternative for medium-to-large sized businesses that frequently access a particular database.

Examples of business databases available on CD-ROM include *Thomas Register* (complete profile and product information of nearly 150,000 companies); *Thomas Online*; *IDD M&A Transactions* (over 30,000 publicly announced mergers, acquisitions, leveraged buyouts, divestitures, and other major transactions); and *IDD Information Services.* The key to this information resource remaining valuable lies in frequent updating. Although disks are inexpensive, CD-ROM products are, generally, updated quarterly or monthly. Some databases are updated *weekly.*

Summary

Thanks to on-line databases, you can retrieve market research information in an hour or less at controllable cost levels. Any company can access a vast number of resources and explore almost any aspect of a business without leaving its premises. With reasonable expenditures of time and money, any size firm can obtain information that is relevant to its particular marketing needs. ■

Washington Watch: Electronic Databases and the Washington Information Machine

In this report:

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Grants .... -112

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This report will help you to:

- Grasp the immense variety of information produced by the federal government, applicable to every aspect of our lives.
- Recognize resources that will enable you to find low-cost, government-printed manuals, books, and statistics that can help you in business.
- Use databases that present government research that can be used in business.
- Get more in return for your tax dollars.

The federal government is a treasure trove of information about almost every imaginable subject. On-line vendors now offer this information electronically, greatly increasing its accessibility. This report describes how businesses, professionals, and general taxpayers can tap government data on-line. Businesses, in particular, can gain an advantage over the competition and better rival larger companies.

An Information Cornucopia

While the federal government may not always be perceived as a font of wisdom when it comes to decision making, it does represent the headwaters of an immense river of information. Daily, federal employees collect, analyze, and transmit information to Washington for publication. Commissions for reports and studies from federal agencies support an entire industry of consultants and research staffs in and around the "beltway," as the circle Interstate 495 makes around the city is locally known. Each month, professors and graduate students at colleges and universities win federal grants to study some macro or micro phenomenon.

In short, the federal government prepares and produces a staggering quantity of information each

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This report, originally developed by Alfred Glossbrenner, a member of Datapro's advisory board, was updated by Ronald G. Albright, Jr., M.D. Dr. Albright is a practicing physician who has been widely published in both the lay and medical press on the applications of computers in medicine. He has spoken to numerous national and regional societies on applying computers to patient care and information access. He is the author of "A Basic Guide to Online Information Resources for Health Care Professionals" (Information Resources Press, Arlington, VA).

year. The breadth and depth of its coverage are enormous too. As expected, there is plenty of information on the economy (consumer prices, employment rate, inflation rate, trade balance, etc.). There is also a great deal of census data (average household income by county, number of working single mothers, relative cost of housing in different locations, and so on). In addition, there is information regarding requests for proposals, defense industry data, and the like.

Although one would presume the government would generate this kind of information, little of it is likely to be of much interest or use to the average person. What most people do not know, however, is that these conventional topics barely scratch the surface. You would not expect, for example, a 4-page publication telling you how to read a food label (dating, symbols, grades, and nutritional information), one called *Weed Control in Lawns and Other Turf* (41 pages), or an illustrated Gasoline Engine Tune-Up guide (153 pages). Yet useful, fact-packed, consumer-oriented publications such as these are available in abundance, sometimes for free.

The same depth and diversity of information can be found among the various arms of the three branches of government. In addition to the *Congressional Record*, for example, transcripts of House and Senate committee and subcommittee hearings, related documents, special publications, and reports are available. Presidential documents and executive orders, current and proposed regulatory agency rules, and transcripts of speeches made by administration officials are also available. The federal government also publishes Supreme Court decisions and those of the lower federal courts.

Finally, the publication *media* can be as varied as the subject matter. In addition to booklets and printed reports, the government publishes maps, charts, computer programs (on disk), films, filmstrips, commercial-quality magazines, and videotapes.

All these sources lead to the central question this report considers. Because the government itself does not know everything it publishes, how can you as an average citizen ever hope to find the information you want or need? And given this situation, is it any wonder that more people do not take advantage of the governmental treasure houses of important, useful information their tax dollars have helped to create?

Government Data On-Line

The solution to both of these problems lies in the on-line world. It is, in fact, as close as any personal computer, modem, and telephone. Today, vast quantities of federal information are available as electronic databases accessible via phone through such on-line services as DIALOG, BRS, ORBIT, NewsNet, LEXIS/NEXIS, and similar systems.

That is convenient, to be sure. It means that as long as you have access to a telephone, neither your location on the planet nor the time of day makes any difference. With a few keystrokes, there is a good chance you can order the federally produced information you need to begin scrolling down your screen. But it is much more than convenient. Having vast quantities of government information available as electronic databases vastly increases both its utility and its power.

Case in Point—Today's Cholesterol Controversy

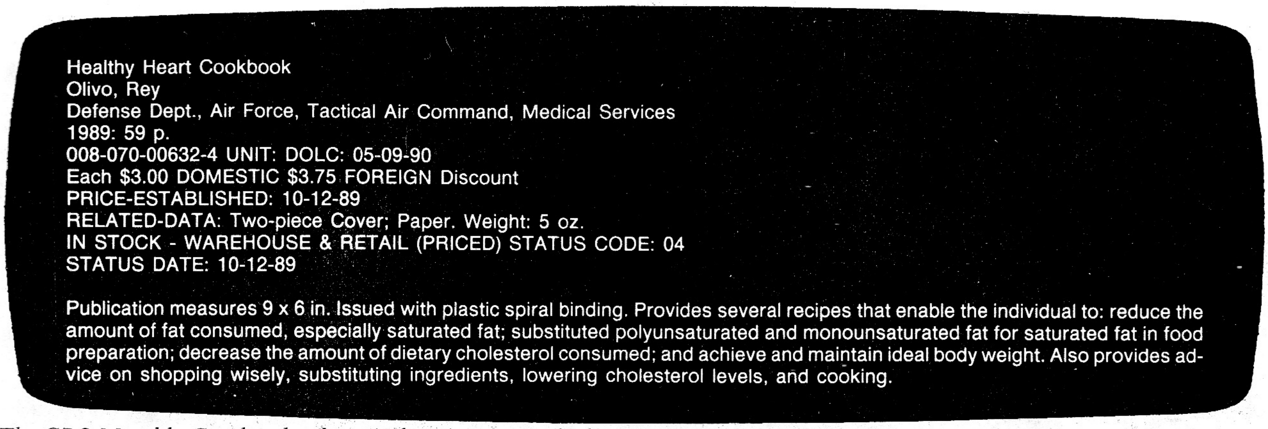
Perhaps nothing has perplexed health-conscious consumers more than the current row over cholesterol in the diet and its effect on our longevity. First there was the revelation that cholesterol was bad. Then came the flurry that told us to eat bran to lower our cholesterol. A glut of new grocery store products followed. Now, we have heard that bran does nothing. Who is right? What should we eat?

Many sources and avenues can yield the answers: Personal physicians are the primary source; also, obtain literature from several medical associations, such as the American Heart Association. But while the information will be accurate, it may not be complete.

You might not think to tap the federal government information storehouses. If you did, you would probably think in terms of a trip to the library instead of a quick session on-line. And that, of course, is one of the main points of this report. In the time it takes most people to drive to the library, you can be well on your way toward obtaining the information you need.

Consider, for example, Figure 1, a search of the *Government Printing Office (GPO) Monthly Catalog* database on DIALOG. This turned up a 53-page manual on how to shop and prepare meals for a "healthy heart." The manual was from, of all places, the Department of Defense (DOD) and the Tactical Air Command. We are told it was in stock

Figure 1.
Sample GPO Catalog Search



```
Healthy Heart Cookbook
Olivo, Rey
Defense Dept., Air Force, Tactical Air Command, Medical Services
1989: 59 p.
008-070-00632-4 UNIT: DOLC: 05-09-90
Each $3.00 DOMESTIC $3.75 FOREIGN Discount
PRICE-ESTABLISHED: 10-12-89
RELATED-DATA: Two-piece Cover; Paper. Weight: 5 oz.
IN STOCK - WAREHOUSE & RETAIL (PRICED) STATUS CODE: 04
STATUS DATE: 10-12-89

Publication measures 9 x 6 in. Issued with plastic spiral binding. Provides several recipes that enable the individual to: reduce the
amount of fat consumed, especially saturated fat; substituted polyunsaturated and monounsaturated fat for saturated fat in food
preparation; decrease the amount of dietary cholesterol consumed; and achieve and maintain ideal body weight. Also provides ad-
vice on shopping wisely, substituting ingredients, lowering cholesterol levels, and cooking.
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The GPO Monthly Catalog database (File 66) was searched on the DIALOG system for the term "CHOLESTEROL." Among the 10 references ("hits") containing these terms was one shown above.

and costs only $3. Other consumer materials included a manual called *So You Have High Cholesterol* (answering the most common questions a patient may have about the problem) and another dietary guide called *Eating to Lower Your Cholesterol* ($2, from the National Institutes of Health). For health professionals, there was a manual entitled *Costs and Effectiveness of Cholesterol Screening in the Elderly* and a statistical review of the information on the effects of cholesterol on life expectancy.

Since Congress legislates on health and related matters, it makes sense to also check the *Congressional Information Service (CIS)* database. Since it, too, is on DIALOG, switching over to CIS takes about four keystrokes. CIS covers the working papers of the 300 or so House and Senate committees and subcommittees. The database does not contain these items themselves. Instead, it contains bibliographic records referencing them. Thus, obtaining a hearing transcript is a two-step process. First you locate the relevant hearing(s) by searching the database. As Figure 2 shows, we searched on the term "CHOLESTEROL." The actual publication must be ordered from CIS or some other source.

After reviewing the database record shown in Figure 2, you may conclude that a copy of the actual transcript will not serve your purposes. But look at the other information the record provides. In fact, one of the hearing witnesses is of special note: the American Dietetic Association. Perhaps it has information for the consumer?

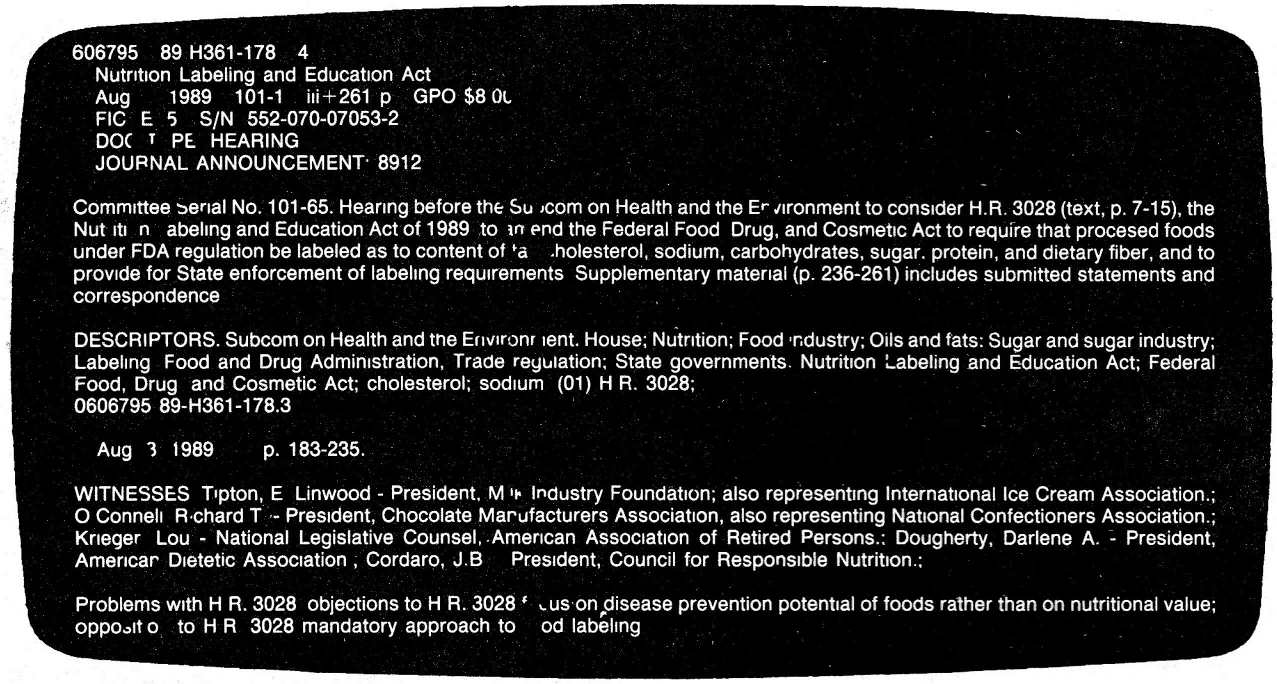
An association name, however, is worth very little without an address. And the CIS record does not even hint at the home city of the two associations we are interested in. Since many associations are based in Washington, DC, you could try directory assistance again and hope the association was headquartered there.

There is, however, a much easier way. Gale Research Company publishes the *Encyclopedia of Associations* that is all but guaranteed to include the items we want. You could go to the library to consult this tome, but as it happens, it is available as an electronic database housed on the DIALOG system. With a few keystrokes, we can be there and searching for the two associations cited in the CIS record.

Figure 3 shows the successful results of a search for the American Dietetic Association. We would only add that since one of the prime directives of all associations is information dissemination, it makes good sense to call or write this organization about your cholesterol-related questions. Notice, also, that it is not based in Washington, DC.

The searches shown in Figures 1 through 3 required less than 12 minutes and cost less than $6. Taken alone, they did not provide the exact information on high cholesterol and its effects on health and longevity. But as is so often the case with online searches, they offered a veritable sheaf of pointers aimed at the contacts and organizations most likely to have the needed information. And they did so with unrivaled speed.

Figure 2.
Sample CIS Search



```
606795   89 H361-178   4
   Nutrition Labeling and Education Act
   Aug      1989   101-1   iii+261 p   GPO $8.00
   FICHE 5   S/N  552-070-07053-2
   DOC TYPE  HEARING
   JOURNAL ANNOUNCEMENT: 8912

Committee Serial No. 101-65. Hearing before the Subcom on Health and the Environment to consider H.R. 3028 (text, p. 7-15), the
Nutrition Labeling and Education Act of 1989  to amend the Federal Food  Drug, and Cosmetic Act to require that procesed foods
under FDA regulation be labeled as to content of fat, cholesterol, sodium, carbohydrates, sugar. protein, and dietary fiber, and to
provide for State enforcement of labeling requirements  Supplementary material (p. 236-261) includes submitted statements and
correspondence

DESCRIPTORS. Subcom on Health and the Environment. House; Nutrition; Food industry; Oils and fats: Sugar and sugar industry;
Labeling  Food and Drug Administration, Trade regulation; State governments. Nutrition Labeling and Education Act; Federal
Food, Drug  and Cosmetic Act; cholesterol; sodium  (01) H R. 3028;
0606795 89-H361-178.3

   Aug  3  1989        p. 183-235.

WITNESSES  Tipton, E  Linwood - President, Milk Industry Foundation; also representing International Ice Cream Association.;
O Connell  Richard T  - President, Chocolate Manufacturers Association, also representing National Confectioners Association.;
Krieger  Lou - National Legislative Counsel, American Association of Retired Persons.: Dougherty, Darlene A. - President,
American Dietetic Association , Cordaro, J.B    President, Council for Responsible Nutrition.;

Problems with H R. 3028  objections to H R. 3028 focus on disease prevention potential of foods rather than on nutritional value;
opposition to H R  3028 mandatory approach to food labeling
```

The Congressional Information Service (CIS) database was searched on DIALOG for the term "CHOLESTEROL." Among the 90 hits on these terms was the citation shown here of a hearing held by the House Subcommittee on Health and the Environment. Copies of the transcript can be ordered directly from CIS, either while you are connected to DIALOG or by mail or phone.

This is but one example of what might be called "your tax dollars at work on-line." It certainly demonstrates how private citizens can tap the federal government's information riches. But there are also many more possibilities depending on your career or specialty.

Something for Everyone

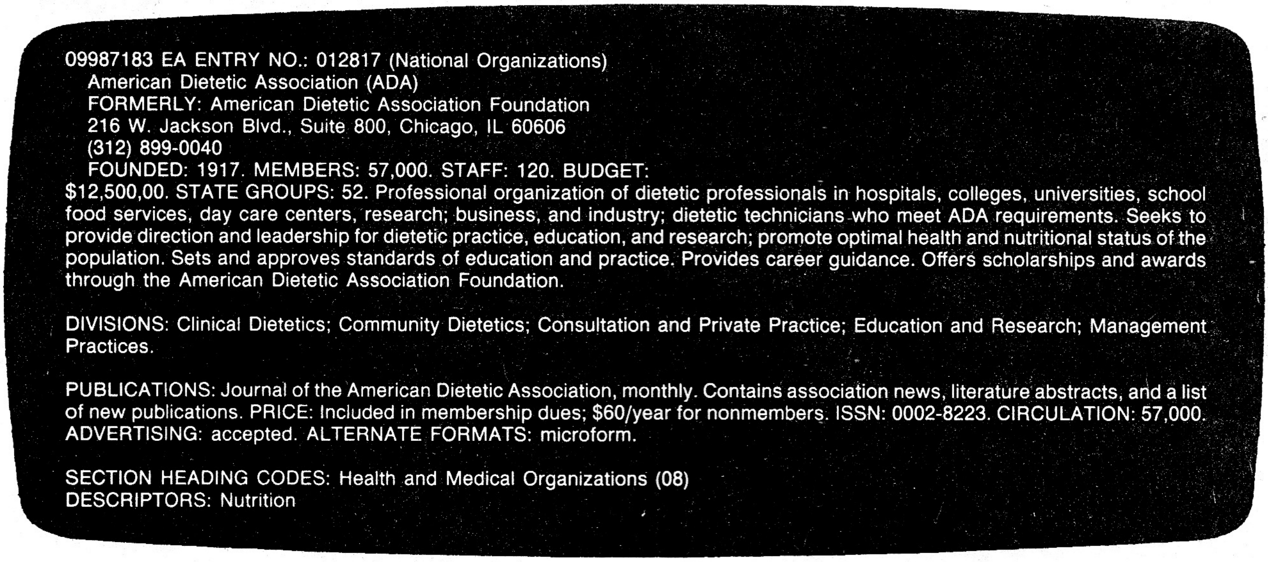
If you are a small businessperson, the on-line field in general, and federal government information in particular, can provide an edge over the competition and help gain equal footing with larger companies. If you are a professional, time and expertise are the main products you have to sell. The availability of so much government information on-line can help you work smarter by minimizing research time while allowing you to easily broaden and deepen your knowledge of the subject at hand.

Politicians and political activists can make limitless use of the on-line resource. A candidate for Congress, for example, can quickly assemble the voting record of the incumbent he or she is running against using one of the databases focusing on the *Congressional Record.* Better still, perhaps, by scanning the *Campaign Contribution Tracking System,* a database of Federal Election Commission reports, a candidate can instantly discover which corporations, individuals, and lobbying groups have given money to his or her opponent. High school and college students will find a wealth of research data for papers and reports, of course, as will writers, journalists, and others with a professional interest in federal activities.

Whether private citizen or politician, however, the main challenge most people face in mining government information is knowing where to look. The digging (searching) is relatively easy: The trick is knowing where to start.

This report provides much guidance toward this end. So many databases offer federally produced information, however, that an entire book would be required to cover them all. For example, we will not consider the many financial and economic databases that track Federal Reserve Board activities, flow of funds, macroeconomic forecasts, government bonds, and the like. Nor will we discuss the many aerospace and defense industry databases. For help there, consult the Subject Index (Tab OL07) to locate these types of databases in

Figure 3.
Encyclopedia of Associations Search



```
09987183 EA ENTRY NO.: 012817 (National Organizations)
  American Dietetic Association (ADA)
  FORMERLY: American Dietetic Association Foundation
  216 W. Jackson Blvd., Suite 800, Chicago, IL 60606
  (312) 899-0040
  FOUNDED: 1917. MEMBERS: 57,000. STAFF: 120. BUDGET:
$12,500,00. STATE GROUPS: 52. Professional organization of dietetic professionals in hospitals, colleges, universities, school
food services, day care centers, research; business, and industry; dietetic technicians who meet ADA requirements. Seeks to
provide direction and leadership for dietetic practice, education, and research; promote optimal health and nutritional status of the
population. Sets and approves standards of education and practice. Provides career guidance. Offers scholarships and awards
through the American Dietetic Association Foundation.

DIVISIONS: Clinical Dietetics; Community Dietetics; Consultation and Private Practice; Education and Research; Management
Practices.

PUBLICATIONS: Journal of the American Dietetic Association, monthly. Contains association news, literature abstracts, and a list
of new publications. PRICE: Included in membership dues; $60/year for nonmembers. ISSN: 0002-8223. CIRCULATION: 57,000.
ADVERTISING: accepted. ALTERNATE FORMATS: microform.

SECTION HEADING CODES: Health and Medical Organizations (08)
DESCRIPTORS: Nutrition
```

We searched Gale Research's Encyclopedia of Associations database (File 114) on DIALOG to locate the addresses and descriptions of the American Dietetic Association cited in the CIS record shown in Figure 2. The results were nearly instantaneous.

the On-line Databases section of this publication. You may also want to consult a reference librarian or an information broker. (For details on how information brokers can help you, see Report OL10-700-101, "Working with Information Brokers.")

This report concentrates on those federal government-related databases likely to interest the greatest number of people—databases covering the *Congressional Record*, census data, presidential speeches, and government statistics. It also limits coverage to databases that are widely and easily available through systems such as DIALOG and its Knowledge Index service, BRS, NewsNet, and CompuServe. We will first consider databases covering Congress, the President and executive branch, and the Supreme Court. Then we will discuss databases covering the government as a whole, followed by brief highlights of several subject-specific databases (such as hazardous wastes or income taxes).

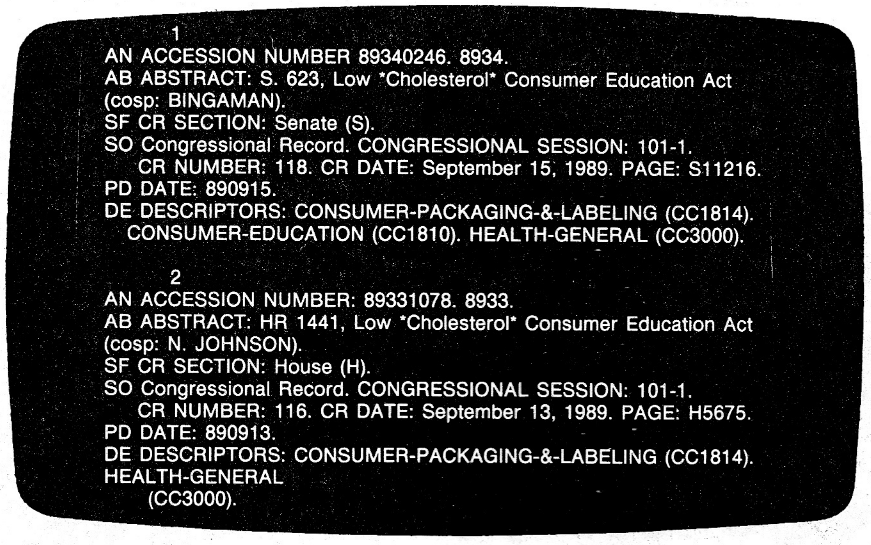
Congressional Information

CIS: Congressional Information Service, Inc.

CIS, available through DIALOG, offers complete access to the working papers of the United States Congress. CIS identifies, collects, indexes, and prepares abstracts for the publications of nearly 300 House, Senate, and joint committees and subcommittees. That covers a lot of ground, and it includes hearings, "prints," reports, documents, and special publications. Collectively, these sources "contain among the best [and sometimes the only] information available on a given subject," according to CIS.

There are many ways to access the data, including a free text search of the abstracts and controlled vocabulary descriptors CIS has assigned to each record. But since each congressional committee has been given a code (H18 is the House Appropriations Committee, S25 is the Senate Budget Committee, etc.), you can zero in even further. You can also search by congressional session, publication year, document type, Government Printing Office (GPO) accession number, witness name, and other fields.

Like any other industry, the federal government has developed its own jargon. Fortunately, the CIS documentation does a good job of explaining what the major codes and abbreviations mean; however, you may not have to use these. It depends on what you are after. If you want to find out what your congressional representative has been up to lately, for example, you can simply search on his or her name.



```
        1
AN ACCESSION NUMBER 89340246. 8934.
AB ABSTRACT: S. 623, Low *Cholesterol* Consumer Education Act
(cosp: BINGAMAN).
SF CR SECTION: Senate (S).
SO Congressional Record. CONGRESSIONAL SESSION: 101-1.
   CR NUMBER: 118. CR DATE: September 15, 1989. PAGE: S11216.
PD DATE: 890915.
DE DESCRIPTORS: CONSUMER-PACKAGING-&-LABELING (CC1814).
  CONSUMER-EDUCATION (CC1810). HEALTH-GENERAL (CC3000).

        2
AN ACCESSION NUMBER: 89331078. 8933.
AB ABSTRACT: HR 1441, Low *Cholesterol* Consumer Education Act
(cosp: N. JOHNSON).
SF CR SECTION: House (H).
SO Congressional Record. CONGRESSIONAL SESSION: 101-1.
   CR NUMBER: 116. CR DATE: September 13, 1989. PAGE: H5675.
PD DATE: 890913.
DE DESCRIPTORS: CONSUMER-PACKAGING-&-LABELING (CC1814).
HEALTH-GENERAL
     (CC3000).
```

Figure 4.
Congressional Record Abstracts Search

The database Congressional Record Abstracts was searched on BRS/Maxwell for information on "anti-cholesterol" activities on the floor of the House. There were 29 records that matched this simple request; the first 2 are shown here.

As we have seen, however, this database has uses that go far beyond the political. Congress prepares or commissions special reports on virtually any conceivable subject, and it frequently summons expert witnesses. So you may be able to search using simply the keywords that refer to your topic of interest, such as "CHOLESTEROL" (see Figure 2). Once you find what you want, you can order copies directly from CIS, from the government, or from some other document delivery service.

Congressional Record Abstracts

As we have seen, the CIS database covers what goes on in congressional committees. *Congressional Record Abstracts* covers debates and other activities occurring on the floor of the two Houses. The Congressional Record is published every day that either the House or the Senate is in session. It contains bill and resolution introductions: floor debates; roll call votes; and much more, including an "Extension of Remarks" section that allows senators and representatives to insert whatever they please, regardless of whether it was presented on the floor.

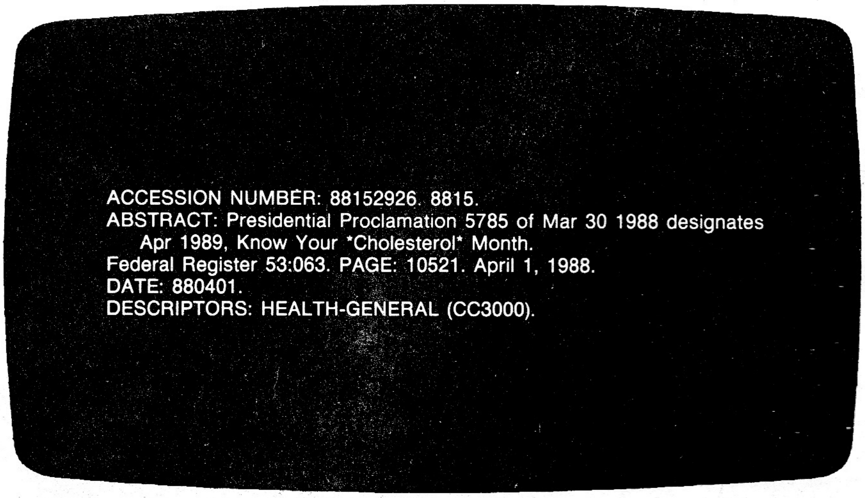
Congressional Record Abstracts is produced by Capitol Services, Inc., a division of the National Standards Association, Inc.; it is available on DIALOG, ORBIT, and BRS. Though the word "abstracts" is part of its name, "annotated index" might be more accurate. For example, for our examination of what Congress is doing about the cholesterol issue, we chose to go on-line for more information. As Figure 4 shows, locating the correct page of the correct edition of the Congressional Record was a simple matter of using "CHOLESTEROL" as a keyword. Nothing from the actual proceedings was "abstracted." But the actual text of the discussion and the "Low Cholesterol Consumer Education Act" (Senate Bill 623, and House 1441) could be ordered directly from the database producer or by calling a local library that subscribes to the Congressional Record.

Executive Branch Information

We have seen how easy it is to examine what the Legislative Branch of the government is doing. What about the Executive Branch? Several databases cover the presidency, the cabinet, the regulatory agencies, and other arms of the Executive Branch.

Federal Register Abstracts

One of the oldest and, perhaps, most respected databases covering the Executive Branch is *Federal Register Abstracts (FedReg)*. The *Federal Register* is published every official U.S. federal working day. Its official charter is to inform the public on Executive Branch matters. The document contains presidential documents, summaries of agency rules and regulations, and documents that must be published by law. The database contains many types of records: rules, proposed rules, presidential documents, executive orders, notices, meetings, hearings, and public law notices. (See Figure 5.) FedReg is available on DIALOG, BRS, and ORBIT.



```
ACCESSION NUMBER: 88152926. 8815.
ABSTRACT: Presidential Proclamation 5785 of Mar 30 1988 designates
    Apr 1989, Know Your *Cholesterol* Month.
Federal Register 53:063. PAGE: 10521. April 1, 1988.
DATE: 880401.
DESCRIPTORS: HEALTH-GENERAL (CC3000).
```

Figure 5.
Federal Register Search

From the Federal Register database on BRS/Maxwell, 20 records were retrieved on the keyword "CHOLESTEROL." This was the second and only one pertaining to activities of Ronald Reagan.

What did Ronald Reagan and his associates have to say about cholesterol? A quick search on BRS/Maxwell produced 20 records, mostly of meetings at the National Institute of Health. The record shown in Figure 5 is the only one concerning Reagan.

The Federal Index

The Federal Index, another database produced by CSI, is also on DIALOG as File 20. This contains similar information, but it is a closed file, covering only October 1976 through November 1980. FedReg starts in March 1977 and is continually updated.

Full Text on NEXIS

Among other things, Mead Data Central's NEXIS system carries the full text of the Federal Register dating from July 1, 1980 to the present. Issues are available for searching usually within 72 hours of publication. NEXIS also carries the *Code of Federal Regulations*, an annual revised codification of the general and permanent rules published in the Federal Register. A third file, *Presidential Documents*, published by the Office of the Federal Register, contains the full text of the weekly compilation of presidential documents and the annually produced *Public Papers of the Presidents.* These are the official series of presidential writings, addresses, news conferences, press releases, executive orders, proclamations, transcripts of radio addresses, remarks by the President at various functions, and so on.

Washington PressText

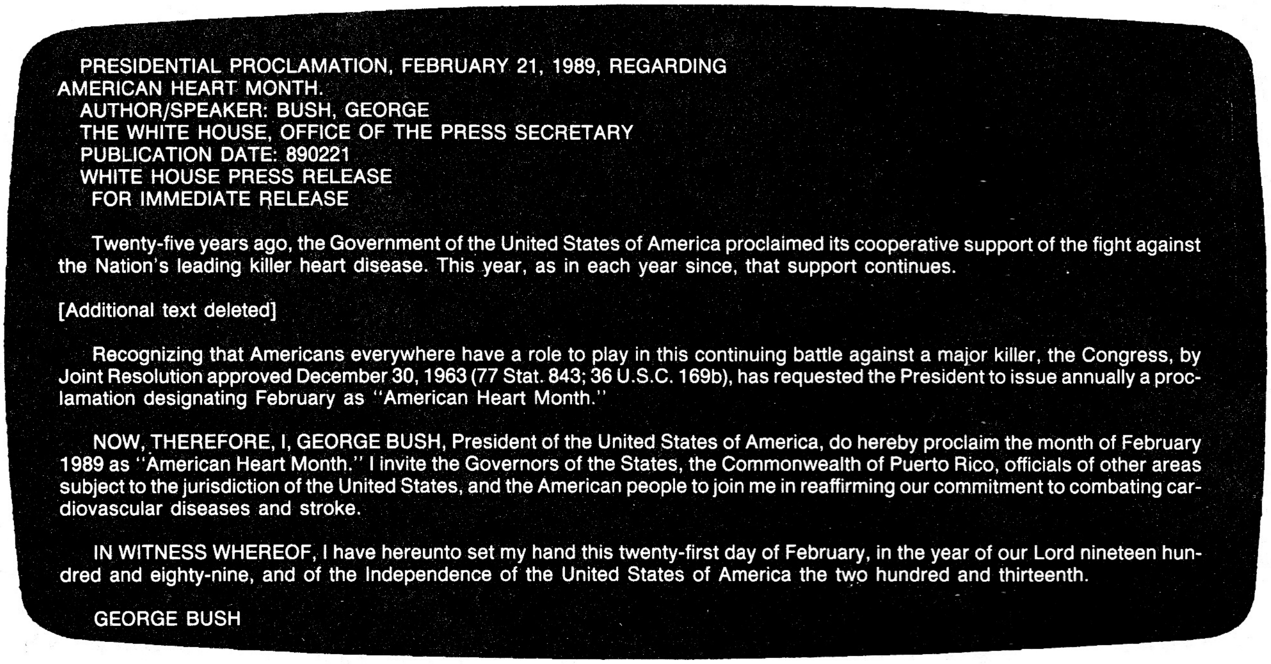
Because newspaper space and television time are limited, journalists can usually offer only brief summaries or 10-second "sound bites" of presidential speeches, State Department briefings, and the like. *Washington PressText*, a DIALOG (File 145) database produced by the PressText News Service, in contrast, offers the full text of nearly everything the White House and State Department press offices issue.

Updated each weekday, the source materials for this database are the same documents made available to the Washington press corps by the two press offices. Coverage includes presidential speeches, news conferences, interviews, letters to Congress, state dinner toasts, and daily calendars. From the State Department come speeches, news conferences, appointments, Congressional testimony, and arrival/departure statements delivered to visiting dignitaries. You can locate documents by a simple, free text search (simply key in what you are interested in) or by specifying fields such as author/speaker, country name, and publication date. (See Figure 6.)

Washington PressText also contains the full text of several key personnel directories. These are the State Department's *Key Officers of Foreign Service Posts: A Guide for Business Representatives*, the *Washington Diplomatic List*, and *Foreign Consular Offices in the U.S.* When searched by country name, these directories yield a list of the names and addresses of the people or offices to contact in each case.

Also included are the State Department's *Background Notes.* This material offers in-depth profiles of foreign nations, including information

Figure 6.
Washington PressText Search



```
  PRESIDENTIAL PROCLAMATION, FEBRUARY 21, 1989, REGARDING
AMERICAN HEART MONTH.
  AUTHOR/SPEAKER: BUSH, GEORGE
  THE WHITE HOUSE, OFFICE OF THE PRESS SECRETARY
  PUBLICATION DATE: 890221
  WHITE HOUSE PRESS RELEASE
   FOR IMMEDIATE RELEASE

   Twenty-five years ago, the Government of the United States of America proclaimed its cooperative support of the fight against
the Nation's leading killer heart disease. This year, as in each year since, that support continues.

[Additional text deleted]

   Recognizing that Americans everywhere have a role to play in this continuing battle against a major killer, the Congress, by
Joint Resolution approved December 30, 1963 (77 Stat. 843; 36 U.S.C. 169b), has requested the President to issue annually a proc-
lamation designating February as "American Heart Month."

   NOW, THEREFORE, I, GEORGE BUSH, President of the United States of America, do hereby proclaim the month of February
1989 as "American Heart Month." I invite the Governors of the States, the Commonwealth of Puerto Rico, officials of other areas
subject to the jurisdiction of the United States, and the American people to join me in reaffirming our commitment to combating car-
diovascular diseases and stroke.

   IN WITNESS WHEREOF, I have hereunto set my hand this twenty-first day of February, in the year of our Lord nineteen hun-
dred and eighty-nine, and of the Independence of the United States of America the two hundred and thirteenth.

   GEORGE BUSH
```

Washington PressText was searched on the keyword "CHOLESTEROL" and 20 references were found: The first was the proclamation from President Bush proclaiming February 1989 as "American Heart Month." Only a brief portion of the transcript is here.

on demographics, economics, government and politics, history, and foreign relations. Each profile also includes information for travelers. This is the kind of interesting, current, and authoritative information that high school and college students can use as the basis of a paper or report.

Judicial Information

LEXIS and WestLaw

Two competing systems, Mead Data Central's *LEXIS* and West Publishing's *WestLaw*, provide the most comprehensive coverage of federal and Supreme Court documents. Each system includes literally millions of documents, some from the early 1800s. And each typically includes federal and state court reported cases, codes, rules, regulations, and decisions from certain regulatory agencies.

Nearly every aspect of law is covered to such a depth that a subscription to one of these systems may obviate the need for an extensive law library. Unfortunately, both *LEXIS* and WestLaw were designed with lawyers, paralegals, and other trained personnel in mind. Neither is priced for casual use. Nonetheless, lawyers' offices subscribing to one of these systems could certainly provide federal government-produced information.

Laborlaw

Those interested in legal matters may also be interested in *Laborlaw*, a database produced by the Bureau of National Affairs, Inc. Available on DIALOG in two files—*Laborlaw I* (File 244) covers the years 1936 to 1986 and is now a closed file. *Laborlaw II* (File 245) covers 1980 forward. The databases provide summaries of decisions and references to the source of the text of decisions on most matters related to labor. Coverage includes labor relations, fair employment, wages and hours, and occupational safety and health.

The Government as a Whole

Other databases provide access to materials from a broad range of government sources.

GPO Monthly Catalog

We have already looked at how you might use the GPO Monthly Catalog database in everyday life. The *printed* catalog is a hefty (about 400 pages) paperback listing the publications printed, processed, or issued by the U.S. Government Printing Office (GPO) each month. The catalog includes items sold by the Superintendent of Documents, items available from the issuing agencies and other bodies, items for official use, and items sent to federal document depository libraries. (Approximately 1,390 state, university, and other public libraries carry this designation in the United States.)

The items can be anything from computer programs, maps, and microfiche to the standard books, pamphlets, brochures, and folders. Each catalog contains between 1,500 and 3,000 items. That works out to close to 30,000 publications a year, more than enough to keep the many GPO printing plants and thousands of printing contractors busy.

As our previous search for information on "CHOLESTEROL" illustrated, the subjects the GPO Monthly Catalog covers are as varied as life itself. When we searched on the keyword "WALKING," for example, we retrieved an illustrated manual called *Taking Care of Yourself by Walking* produced by the Portland Area Diabetes Program. When we looked for "WORK(W)HOME," we found a monograph called *At Home in the Office: A Guide for the Home Worker* (published in 1984, this was obviously a farsighted work).

The GPO Monthly Catalog covers only some of all of the publications the U.S. government issues yearly. Of those covered, only about 17,000 titles are available directly from the GPO. These items are tagged with a "for sale by" line and the price. If that line does not appear, you will probably have to get the document from the sponsoring agency, from a document delivery service, or from a depository library.

Nevertheless, the GPO Monthly Catalog database offers the quickest, easiest way for the average person to tap government information riches. The database is an incredible resource for high-quality, low-cost information on virtually any topic.

Index to U.S. Government Periodicals

In addition to everything else, the federal government publishes an estimated 1,000 magazines, newsletters, serial publications, and other periodicals. Infordata International Incorporated of Chicago, IL produces an index to 185 of them. A blue-ribbon review board chose the periodicals based on their lasting reference and research value. No other database covers so many of them, nor does the government do this kind of *Reader's Guide to Periodical Literature*-style magazine indexing.

The database corresponds to a quarterly, printed volume of the same name. It is available on-line via BRS and H.W. Wilson's Wilsonline service. The file dates to 1980 and is updated with about 1,100 new items each month. The lag time between publication and on-line availability is often one month or less. The periodicals covered include titles such as *Agricultural Research, Alcohol Health and Research World, Military Chaplin's Review, Navy Civil Engineer, Recombinant DNA Bulletin*, and *Spotlight on Affirmative Employment Programs.*

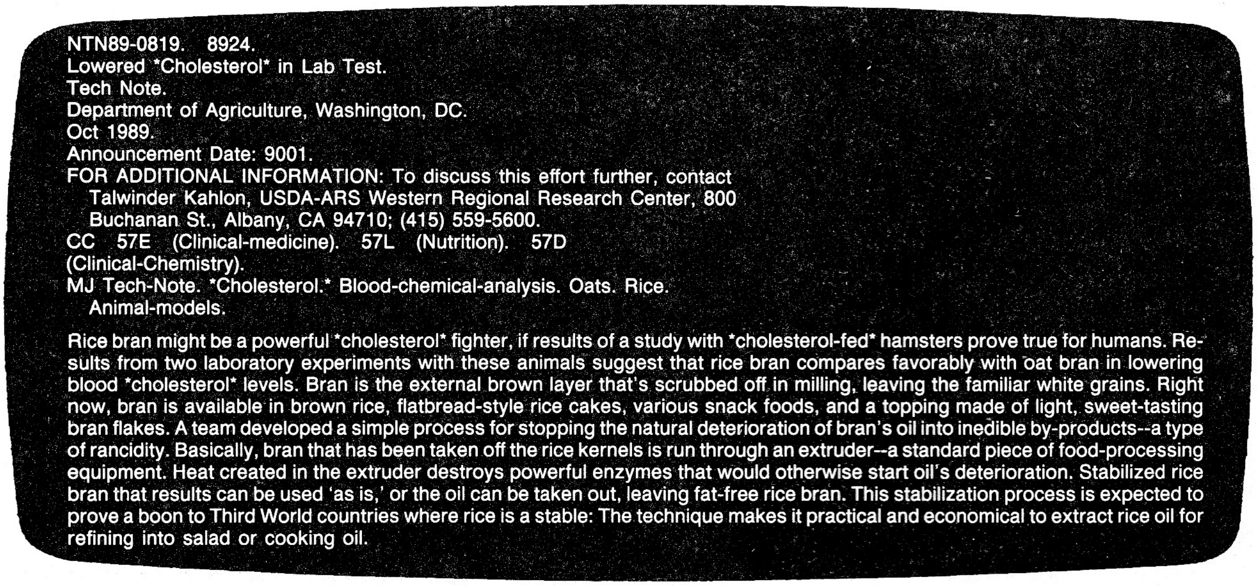
"GOVT," as this database is called on BRS, can be as rewarding to use as the GPO Monthly Catalog, and for the same reason: It covers almost every topic imaginable. When we searched on "DOGS AND FLEAS," we found two articles. One is called *Flea Treatment Limited* (*FDA Consumer*, October 1984) and the other is called *Unscratching of Fido* (*FDA Consumer*, October 1981). The search logic "STRESS WITH PERFORMANCE" yielded two articles. One was called *Stress Train: Training for High Performance*, published in the February 1985 issue of *Military Review*; the other, *Psychology of Performance Under Stress*, was published in the June 1984 issue of *FBI Law Enforcement Bulletin.* Depository and other libraries carry many of these periodicals.

Federal Applied Technology

Not only is the federal government a major information gatherer and publisher, it is also a seedbed for invention. It distributes millions of dollars monthly for original research by universities and private industry. Much of this research, since it is government sponsored, is not subject to patents and copyrights. Thus, it belongs to all of us. For many businesses, developments funded by the government can lead to new technology that can be marketed for profit—if you know where to look.

The *Federal Applied Technology Database*, produced by BRS/Maxwell, abstracts information

Figure 7.
Federal Applied Technology Database Search



```
NTN89-0819.   8924.
Lowered *Cholesterol* in Lab Test.
Tech Note.
Department of Agriculture, Washington, DC.
Oct 1989.
Announcement Date: 9001.
FOR ADDITIONAL INFORMATION: To discuss this effort further, contact
   Talwinder Kahlon, USDA-ARS Western Regional Research Center, 800
   Buchanan St., Albany, CA 94710; (415) 559-5600.
CC  57E  (Clinical-medicine).  57L  (Nutrition).  57D
(Clinical-Chemistry).
MJ Tech-Note. *Cholesterol.* Blood-chemical-analysis. Oats. Rice.
   Animal-models.

Rice bran might be a powerful *cholesterol* fighter, if results of a study with *cholesterol-fed* hamsters prove true for humans. Re-
sults from two laboratory experiments with these animals suggest that rice bran compares favorably with oat bran in lowering
blood *cholesterol* levels. Bran is the external brown layer that's scrubbed off in milling, leaving the familiar white grains. Right
now, bran is available in brown rice, flatbread-style rice cakes, various snack foods, and a topping made of light, sweet-tasting
bran flakes. A team developed a simple process for stopping the natural deterioration of bran's oil into inedible by-products--a type
of rancidity. Basically, bran that has been taken off the rice kernels is run through an extruder--a standard piece of food-processing
equipment. Heat created in the extruder destroys powerful enzymes that would otherwise start oil's deterioration. Stabilized rice
bran that results can be used 'as is,' or the oil can be taken out, leaving fat-free rice bran. This stabilization process is expected to
prove a boon to Third World countries where rice is a stable: The technique makes it practical and economical to extract rice oil for
refining into salad or cooking oil.
```

Example record from Federal Applied Technology Database on BRS/Maxwell. Is it any wonder that one major cereal manufacturer introduced a rice-based breakfast cereal in early 1990?

on technical developments from such federal agencies as NASA, the U.S. Department of Energy, and the National Institute of Standards and Technology (NIST). The database covers, according to BRS, "new product opportunities through licensable U.S. government-owned inventions."

Our search of the database for new technology in the field of cholesterol (our only search phrase), produced 22 hits. Figure 7 shows one record. Myriad new products have appeared in the marketplace as a result of research that originated in federally funded studies.

CENDATA—The U.S. Census Bureau On-Line

We have saved the most innovative statistical database for last. *CENDATA*, produced by forward-thinking people at the U.S. Department of Commerce, Bureau of the Census, contains selected summary statistics from all Census Bureau programs and news releases and product ordering information. Geographically, it offers statistics for the nation as a whole and for individual states, counties, and metropolitan areas and large cities. It covers agriculture, business, construction and housing, foreign trade, international data on 200 countries, manufacturing data, and population data.

This same information is found in hundreds of traditional paper-based Census Bureau reports, including such best-sellers as *Market Absorption of Apartments*; *Advance Monthly Retail Sales*; *Flour Milling Products*; and *Projections of the Population of the United States by Age, Sex, and Race: 1983 to 2080*. What makes CENDATA so special is that the bureau has taken some imaginative steps to make the data as easily accessible as possible.

CENDATA is a menu-driven system. When you log on to DIALOG and enter "BEGIN CENDATA," a greeting screen and main menu like that shown in Figure 8 appear. This figure shows a sample CENDATA search.

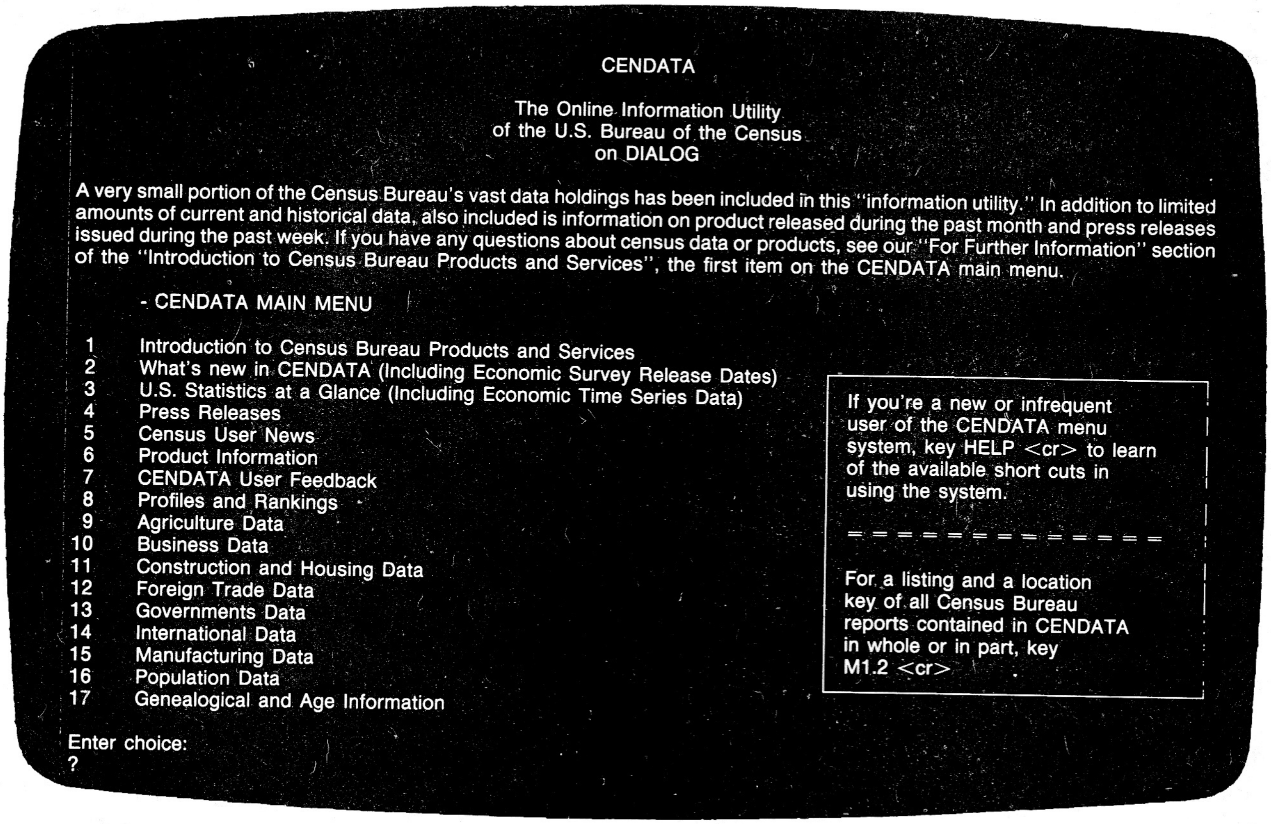
Subject-Specific Databases

Many other government-related databases focus on a given topic.

NewsNet Newsletters

NewsNet, based in Bryn Mawr, PA, specializes in databases consisting of industry- and subject-specific newsletters. These publications are often produced by a single expert, assisted by a small staff, and they offer invaluable insights and information into their respective subject areas. Reading a newsletter is often like listening to a speech or report prepared by someone whose sole job is to

Figure 8.
Sample CENDATA Search



```
                                   CENDATA

                          The Online Information Utility
                         of the U.S. Bureau of the Census
                                  on DIALOG

A very small portion of the Census Bureau's vast data holdings has been included in this "information utility." In addition to limited
amounts of current and historical data, also included is information on product released during the past month and press releases
issued during the past week. If you have any questions about census data or products, see our "For Further Information" section
of the "Introduction to Census Bureau Products and Services", the first item on the CENDATA main menu.

       - CENDATA MAIN MENU

 1     Introduction to Census Bureau Products and Services
 2     What's new in CENDATA (Including Economic Survey Release Dates)
 3     U.S. Statistics at a Glance (Including Economic Time Series Data)    | If you're a new or infrequent   |
 4     Press Releases                                                       | user of the CENDATA menu        |
 5     Census User News                                                     | system, key HELP <cr> to learn  |
 6     Product Information                                                  | of the available short cuts in  |
 7     CENDATA User Feedback                                                | using the system.               |
 8     Profiles and Rankings                                                |                                 |
 9     Agriculture Data                                                     | = = = = = = = = = = = = = =     |
10     Business Data                                                        |                                 |
11     Construction and Housing Data                                        |                                 |
12     Foreign Trade Data                                                   | For a listing and a location    |
13     Governments Data                                                     | key of all Census Bureau        |
14     International Data                                                   | reports contained in CENDATA    |
15     Manufacturing Data                                                   | in whole or in part, key        |
16     Population Data                                                      | M1.2 <cr>                       |
17     Genealogical and Age Information

Enter choice:
?
```

Shown here is a sample search session using CENDATA, a menu-driven database system available through DIALOG. The menu items make it much easier to locate and retrieve the information you seek.

track a particular area. Many of the areas newsletters focus on concern federal government activities.

The names of many of the newsletters available through NewsNet likely to interest someone looking into things in Washington are listed below. Space does not permit a complete explanation of each title; however, you will find more information on each of these databases in the On-line Databases (OL40) section of this publication. (Note that in the titles shown here, BNA is the Bureau of National Affairs, Inc., and CCH is Commerce Clearing House, Inc.):

- Access Reports/Freedom of Information
- Air/Water Pollution Report
- BNA Congressional/Presidential Calendar
- BNA Executive Day
- BNA Tax Updates
- BNA's Daily Tax Report
- BNA's Private Letter Rulings Report
- CCH Tax Day: Federal
- CCH Tax Day: State
- Congressional Activities
- Defense Industry Report
- Defense R&D Update
- FCC Daily Digest
- FCC Week
- Federal Research Report
- Hazardous Waste News
- Industrial Health & Hazards Update
- NASA Software Directory
- Nuclear Waste News
- PACs & Lobbies
- Small Business Tax Review, The
- Space Commerce Bulletin
- Star Wars Intelligence Report
- State Telephone Regulation Report

- Toxic Materials News

The list of subject-specific databases that are either directly derived from or in some way related to federally produced information is extensive indeed.

Grants

A database called *GRANTS* (from The Oryx Press and available on DIALOG as File 85) lists more than 7,000 federal, state, and local government grants available to qualified applicants. It also includes grants made by commercial organizations and foundations. The subjects to be studied under such grants cover over 90 academic subjects including the arts, education, health, humanities, study abroad, and the sciences. You can search for your topic of interest and retrieve information on all available grants, the filing deadline, the requirements, and the money available.

Commerce Business Daily

If you are a businessperson, entrepreneur, consultant, or professional—if you have anything to sell—you should definitely look into the *Commerce Business Daily (CBD)* database (available on DIALOG). Among other things, CBD includes a large percentage of the procurements planned by nearly 5,000 U.S. government agencies.

Government agencies buy everything from buttons to battleships, but to make the sale, you have to know who is in the market for what. A quick search of the CBD database instantly tells you. This is a source of government information relatively few small businesses know about. Of the millions of businesses in the United States, only about 54,000 organizations subscribe to CBD's version.

Federal Research in Progress

Finally, you probably know a great deal of federal money is invested every year in various research projects. The results of the vast majority of these studies are available to all citizens. But you have to know what to ask for. That is where a database called *Federal Research in Progress*, produced by the National Technical Information Service (NTIS) and available on DIALOG (Files 265 and 266), can be so helpful. You certainly do not have to be a scientist to search it. Indeed, since we had recently heard that spraying garden plants with a solution of soap and water was a safe and effective insect deterrent, we decided to check the database for more information.

Searching on "SOAP AND PLANTS," we uncovered a study of Christmas trees in North Carolina designed to test "the efficacy of insecticidal soaps as an alternative to lindane for balsam woolly aphid control." We also learned that when trying to clean plastic pipe, tin, and wood of insecticide residue, the best substances to use (in descending order of effectiveness) are deodorized kerosene, isopropanol, detergent, and soap.

We also decided to see if any researchers had tested the "home remedy" for sleeplessness (a glass of warm milk before bed). We searched on "SLEEP AND MILK" and found a 1987 Columbia University study sponsored by the National Institute of Child Health and Human Development. The retrieved information noted: "Because it has been shown that morphine-like substances are enzymatic digests of B-casein, we will study the relation of milk intake to changes in plasma B-casomorphin and morphiceptin."

Admittedly, only a chemist or a doctor could fully appreciate all of those terms. But even a layperson can glean that milk apparently produces a morphine-like substance when subjected to digestive enzymes. Apparently there *is* a sound scientific basis for the "cure."

Conclusion

With so much federal information now available in electronic database form, scanning tens of thousands of documents for the keywords you want takes only seconds. And displaying the results on the screen takes only a few more. Everyone can now benefit from the information the government produces, thanks to on-line databases.

But first, you must locate the database most likely to contain the federally produced information you seek. We have highlighted many of the most useful databases here, but it is important to emphasize that this is only the beginning. The *Datapro Directory of On-line Services* will be a great aid in your further explorations, as will the advice and suggestions of your local reference librarian. ■

Accessing the Medical Literature On-Line

In this report:

Tips for On-Line Searching .... -103

The MEDLARS System .... -104

Medline .... -104

PaperChase .... -108

Other Access Routes .... -109

Trends .... -110

This report will help you to:

- Assess what information is available in electronic form for health professionals and others interested in medical topics.
- Understand how "Grateful Med" can ease access and information retrieval from Medline.
- Learn how "PaperChase" can guide you to information in Medline files.

Both the number of available medical databases, and their use, continue to grow rapidly. It is easy to understand the surge in popularity. More and more medical professionals—doctors, nurses, pharmacists, and others—who access on-line data are joining traditional users, such as professional researchers or librarians who conduct searches for others.

Information Sources

The "information age" is putting increased pressure on medical professionals who must remain aware of medical advances and discoveries. Traditional information sources such as journals, books, and newsletters are no longer adequate sources for keeping pace with the rapid developments in science and health. Increasingly, workers in all areas of the health sciences are turning to electronic databases to fill the void and sink what John Naisbitt of *Megatrends* fame called the "information float."

There is another trend contributing to the growing popularity of health-related electronic databases. In this age of "consumer activism," patients themselves often seek information so they can better understand the health maintenance and preventive medicine concepts. Patients are no longer content to rely on their

---

This report was prepared exclusively for Datapro by Ronald G. Albright, Jr., M.D. Dr. Albright is a practicing physician who has been widely published in both the lay and medical press on the applications of computers in medicine. He has spoken to numerous national and regional societies on applying computers to patient care and information access. He is the author of "A Basic Guide to Online Information Resources for Health Care Professionals" (Information Resources Press, Arlington, VA).

Figure 1.
Sample Grateful Med Search

```
NLM TIME 19:26:52 DATE 90:049 LINE 678 GM#040010A

WELCOME TO THE NATIONAL LIBRARY OF MEDICINE'S ELHILL RETRIEVAL SYSTEM. YOU ARE NOW CONNECTED TO THE
MEDLINE (1988-90) FILE.

SS 1 /C?                                          AUTHOR COMMENTS
USER:
Cluster Headache (mh)                        <=GM Enters our first Search Term

PROG:
SS (1) PSTG (94)                             <=Medline notifies us there are
                                             94 articles on cluster headache
SS 2 /C?
USER:
1 and review (mh)                            <=GM asks to restrict those 94
                                             articles to review-type
PROG:
SS (2) PSTG (11)                             <=Medline tells us that 11 of the
                                             94 are designated as "reviews"
SS 3 /C?
USER:
2 and not for (1a)                           <=GM asks to further restrict the
                                             remaining 11 to "not foreign"
PROG:                                        language
SS (3) PSTG (4)                              <=We are told that produces 4
                                             postings
SS 4 /C?
USER:
print include ab,mh,ps,la                    <=GM asks the system to "print" them
                                             including the fields for abstracts,
PROG:                                        MeSh, name, and language

1                                            <=Our first article appears
UI—90098565
AU—Ryan RE Jr
AU—Ryan RE Sr
TI—Cluster headaches.
RF—REVIEW ARTICLE: 18 REFS.
AB—The patient with cluster headaches will be afflicted with the most severe type of pain that one will encounter. If the physician can
     do something to help this patient either by symptomatic or, more importantly, prophylactic treatment, he or she will have a most
     thankful patient. This type of headache is seen most frequently in men, and occurs in a cyclic manner. During an acute cycle, the
     patient will experience a daily type of pain that may occur many times per day. The pain is usually unilateral and may be accom-
     panied by unilateral lacrimation, conjunctivitis, and clear rhinorrhea. Prednisone is the first treatment we employ.
```

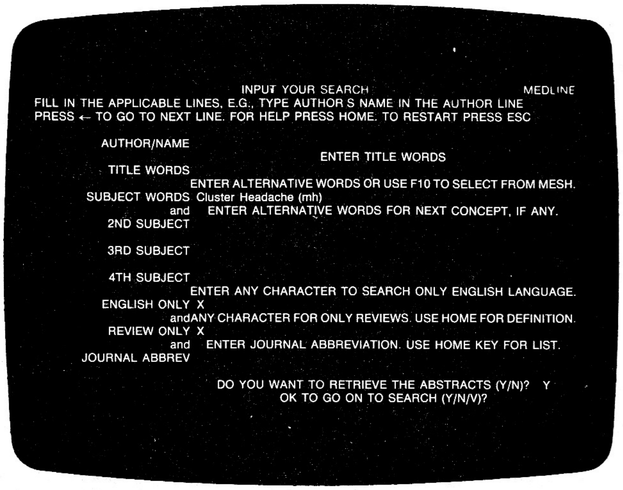
physician as the single source of medical information. They, too, use medical databases to retrieve information to help them make choices in lifestyle, diet, and other health concerns.

The information available to all these groups is expansive. The National Library of Medicine (NLM), for example, now indexes well over 4,000 health care journals. It compiles abstracts for most citations. References in its *Medline* database go back to 1966. In all, the NLM holds about 3.8 million items, including books, journals, technical reports, manuscripts, microfilms, and pictorial materials. Although some overlap exists, other organizations collect data from an equally impressive number of sources. Elsevier Science Publishers, producers of the *Embase* database (the original *Excerpta Medica*) is probably Medline's closest competitor. *Embase* follows 3,500 primary journals from 110 countries and selectively screens an additional 1,000 publications for appropriate articles. Medline officials estimate that *Embase* produces only about a 30 percent overlap with Medline data. *Embase* grows by at least 300,000 records annually, according to Elsevier.

The *International Pharmaceutical Abstracts* database from the American Society of Hospital Pharmacists is another example. This database includes material from 650 international journals and about 30 additional state pharmacy journals. It grows by about 144,000 records annually.

With the national interest in "acquired immune deficiency syndrome" or "AIDS," it is not

Figure 2.
Medline's Search Screen



```
                                INPUT YOUR SEARCH                        MEDLINE
FILL IN THE APPLICABLE LINES, E.G., TYPE AUTHOR S NAME IN THE AUTHOR LINE
PRESS ← TO GO TO NEXT LINE. FOR HELP PRESS HOME. TO RESTART PRESS ESC

         AUTHOR/NAME
                                          ENTER TITLE WORDS
          TITLE WORDS
                   ENTER ALTERNATIVE WORDS OR USE F10 TO SELECT FROM MESH.
        SUBJECT WORDS Cluster Headache (mh)
                  and   ENTER ALTERNATIVE WORDS FOR NEXT CONCEPT, IF ANY.
          2ND SUBJECT

          3RD SUBJECT

          4TH SUBJECT
                   ENTER ANY CHARACTER TO SEARCH ONLY ENGLISH LANGUAGE.
         ENGLISH ONLY X
                  andANY CHARACTER FOR ONLY REVIEWS. USE HOME FOR DEFINITION.
          REVIEW ONLY X
                  and   ENTER JOURNAL ABBREVIATION. USE HOME KEY FOR LIST.
       JOURNAL ABBREV

                        DO YOU WANT TO RETRIEVE THE ABSTRACTS (Y/N)?  Y
                              OK TO GO ON TO SEARCH (Y/N/V)?
```

surprising that a new database covers the topic in detail. The *AIDS Knowledge Base*, produced by the Massachusetts Medical Society, includes current, comprehensive information on all aspects of the disease. Available topics include epidemiology, pathogenesis, diagnosis, prevention and treatment strategies, and societal and psychological aspects.

What Is Available

These and other sources make available a huge body of medical information for researchers, practitioners, or anyone else interested in medical topics. Highly specialized data is now available to patients and other individuals outside the medical field. With improved database interfaces and software communications and search tools, the once-restricted domains of electronic database searching are now "open to the public."

Tips for On-Line Searching

Although the subject is sometimes highly specialized, the techniques for searching medical databases are not much different from those for other types of databases. As always, you should prepare as completely as possible before going on-line.

Here are the steps you should follow:

1. Plan Your Search
2. Identify the Audience
3. Narrow the Topic
4. Be Willing to Prospect
5. Consider Using Intermediaries

A necessary first step, whenever you do a search, is to consider who you are doing the search for. If you are conducting the search for yourself, then you should have a pretty good idea what you are looking for and how you will use the information. If you are conducting the search for someone else, however, try to understand their information needs before you go on-line. If the requester is a doctor searching for articles about a certain drug therapy, for example, Medline or one of the dedicated medical databases may provide all the data you need.

If you are conducting a search for a patient, someone who is about to undergo a certain treatment and who wants to understand the procedure and read about others who have the same problem, however, you may need a broader search. Medline or other broad-based medical databases will give you the clinical information, and some of this data should be included in a search for an inquisitive patient. But you also should search some of the popular journals and magazines to find any articles targeted to the layperson. Although a brief article about a disease or procedure in a news magazine or general-interest publication will not include the depth of information found in research reports in medical journals, it can provide the basis of understanding required to read the more learned journals. The lay reader can use these popular articles to learn terminology and to gain the first level of understanding required to further explore the topic.

The point is, do not limit your research horizons to the traditional topic areas or databases. This admonition is especially applicable when you are researching rare topics, highly specialized areas, or "prospecting" for data (unsure of precisely what data you are seeking). The growth of information in electronic form makes these kinds of research projects less intimidating than they once were.

Some research libraries conduct Medline searches for the general public at rates equal to or below the standard charges. If you are not familiar with on-line database access and have a full-featured medical library in your community, this can be a useful and often cost-effective method of searching the medical literature. Certainly, going through an intermediary is more efficient and cost

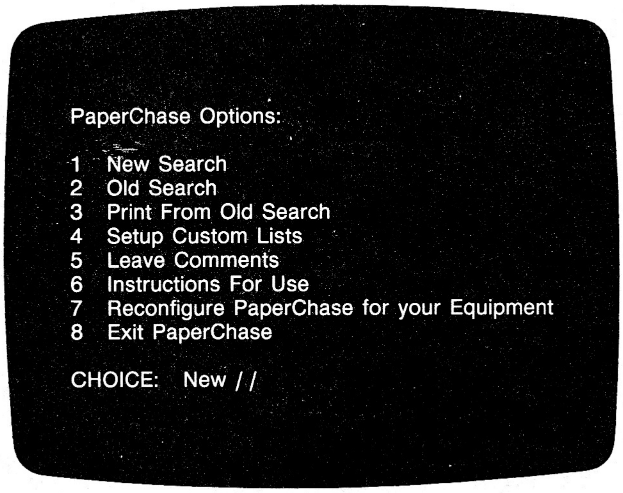


Figure 3.
PaperChase's Opening Menu

```
PaperChase Options:

1  New Search
2  Old Search
3  Print From Old Search
4  Setup Custom Lists
5  Leave Comments
6  Instructions For Use
7  Reconfigure PaperChase for your Equipment
8  Exit PaperChase

CHOICE:  New //
```

effective than using printed indexes. If you frequently need medical information, however, or you do not have a library facility near you, you *can* go on-line yourself. This report describes some tools that make searching on-line databases quite simple.

The MEDLARS System

The most comprehensive and most searched medical databases are derived from MEDLARS, a series of databases and information services from the National Library of Medicine (NLM), a division of the National Institutes of Health (NIH). To many researchers, MEDLARS (Medical Literature Analysis and Retrieval System) is synonymous with Medline, the premier database in the MEDLARS system. Actually, MEDLARS includes over 20 databases (the number changes with additions and combinations) covering everything from AIDS (*Aidsline*) and audiovisuals (*AVline*) to thesaurus information (*MeSH*) and toxicology (*Toxline*, *ToxNet*).The NLM's on-line databases are readily available for reasonable fees. Until the mid-1980s, MEDLARS system accounts were restricted to librarians and search professionals who completed mandatory database access and search training. Now, MEDLARS databases are available to all without sign-up fees or other special requirements. The user simply pays for on-line time and for off-line prints or other services ordered.

Medline

Medline, the largest and the most popular of the MEDLARS' databases, is available directly through NLM mainframes in Bethesda, MD or through several "value-added" vendors including DIALOG, Maxwell Online, and PaperChase. Several vendors, including DIALOG, also offer Medline in a CD-ROM version. Despite the enormous storage capacity of these disks, only about one year of Medline data fits on a single disk. This makes CD-ROM searches across several years more difficult. If you normally need only the most current data, however, and you use Medline often, the CD-ROM version will save you money.

If you regularly conduct broad searches of Medline or one of the other MEDLARS databases, and you need the most up-to-date information, consider a direct account with MEDLARS. The on-line charge is only $22 per connect hour, whereas third-party vendors, such as DIALOG, generally charge a premium. On DIALOG, for example, Medline costs $36 per connect hour.

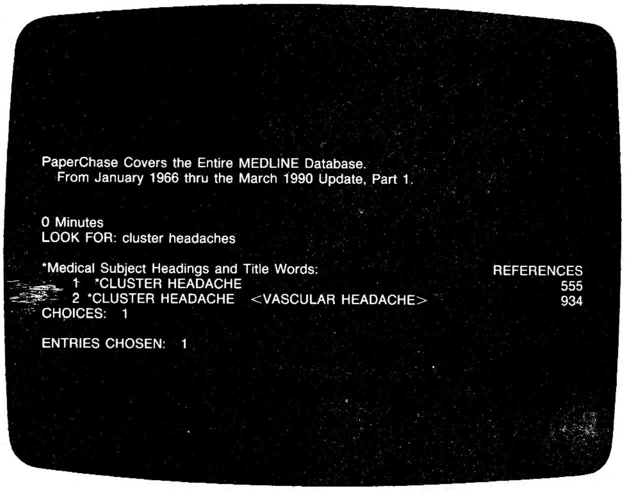
Grateful Med

The MEDLARS group also produces Grateful Med, a communications software program for personal computers that eases access to MEDLARS databases. The current IBM PC-compatible version, Grateful Med 5.0, began shipping in early 1990. The first Macintosh version of the software began shipping in late 1989. The NLM's experience is similar to most other on-line services; increasingly, the person who actually uses the information (the end user) is doing his or her own searches. Medline and the other MEDLARS databases are "command-driven" systems (without menus) and, as a result, are not "user friendly" by today's standards. Experienced database users can easily learn the system. Infrequent users or health professionals without library science backgrounds, however, can easily get lost and frustrated. Grateful Med opened up MEDLARS to virtually anyone with a computer.

Medical Information for Everyone

Grateful Med is one of an increasingly large group of communications software packages known as "front ends." They are devised to tame the often idiosyncratic search commands systems such as MEDLARS require the searcher to master.
The concept is a simple one. Front ends shield the

Figure 4.
PaperChase Search Entry Screen



```
PaperChase Covers the Entire MEDLINE Database.
  From January 1966 thru the March 1990 Update, Part 1.

0 Minutes
LOOK FOR: cluster headaches

*Medical Subject Headings and Title Words:                 REFERENCES
    1  *CLUSTER HEADACHE                                          555
    2 *CLUSTER HEADACHE  <VASCULAR HEADACHE>                      934
CHOICES:  1

ENTRIES CHOSEN:  1
```

user from the actual system. The user sets up the search *before* going on-line. The user loads his or her password and ID beforehand. To start a search the user tells Grateful Med which database to access. Then, depending on the database, Grateful Med displays the appropriate search "form" to be filled out. Once the search request is entered, Grateful Med connects to the MEDLARS network and sends the search details to the system, converting the information to language MEDLARS can understand. The results are then collected and stored on the user's disk, while the software disconnects from the host. All these steps are performed automatically—the user never has to touch the keyboard once the search process is started. Since the software "knows" what its search goal is, the commands are entered on the system quickly and efficiently, saving the user time and connect charges.

Features

With Grateful Med, you construct database searches off-line using specially designed screens provided by the software. The input screens resemble file cards with several fields of information, appropriate to the selected database. You type in just the data you need—whether it is for a specific journal or author, an article title, an index word or phrase, or any combination of these. You can specify whether you want to search for only English-language papers or papers classified by MEDLARS as "review" articles. Once these steps are completed, you can tell Grateful Med whether to retrieve abstracts or the index terms associated with each reference or "hit."

One of Grateful Med's most useful features is its on-line thesaurus. This saves users the trouble of keeping a printed copy of MEDLARS massive Medical Subject Headings (MeSH) listings. Instead, the listings are on-line and accessible with a single keystroke. You simply enter the phrase you are searching for press a command key, and Grateful Med shows you a list of the closest matches to your term in the accepted MEDLARS format. With another few keystrokes, you can pick the correct term and Grateful Med will automatically insert it in your search form. A listing of the recognized journal abbreviations is also available from within Grateful Med, should you wish to restrict your search to a single journal's listings.

When you go on-line, the proper search syntax is automatically constructed for the specified database. After the appropriate references are collected and stored on your disk, you can scan the found references, print them, or store them to a second diskette file for further processing off-line.

Grateful Med standardizes search procedures across all the supported databases. Currently, you can search most of the NLM's databases with Grateful Med. Grateful Med offers an "expert searcher" facility that lets you enter search criteria manually in the case of unsupported databases.

Grateful Med's Lure

While many medical librarians and professional searchers still prefer direct, interactive searching over using Grateful Med, it has been an enticing lure for pulling the nonprofessional onto the MEDLARS system. MEDLARS usage figures support this observation. The NLM reports about 20,000 nodes accessing MEDLARS mainframe data—an estimated 8,000 of those are in the offices of doctors and other end users. The software is most popular with health care professionals. High school science teachers and public librarians, however, also use it. That is a noticeable change from 10 years ago when almost all users were institutional subscribers. In addition, the number of searches is climbing dramatically, from less than 1.5 million per year in 1980 to more than 4 million searches in 1988.

Table 1. Examples of Medical Databases

Database	Producer	Focus
Aidsline	NLM	Bibliographic information extracted from Medline (see below) that relates to the disease AIDS. Information dates from 1980. Updated monthly.
Biobusiness	BIOSIS	Bibliography of the economic aspects of biological and biomedical research covering a broad range of disciplines. Updated monthly.
Cancerlit	NLM	Bibliographic data from journals, meeting abstracts, government reports, theses. Updated quarterly.
Cancerproj	NLM	Reports on current cancer research projects, including those that terminated less than a year ago. Updated quarterly.
Catline (Catalog Online)	NLM	On-line bibliography for the NLM's library. About 600,000 entries; about half are non-English. Weekly updates.
Chemline	NLM	On-line database of over 650,000 chemicals. Includes molecular formulas, generic and trivial names, and pointers to other files for more information.
EMBASE (Excerpta Medica)	ESP	Bibliography of world literature on human medicine from 3,500 primary journals and 1,000 selective journals. Updated monthly.

Pricing

Grateful Med is a bargain at $29.95 (available from the National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151-9990), including free updates. The NLM produces an on-disk tutorial for using Grateful Med. It is free to all who purchase the Grateful Med program. Another tutorial, MedTutor, is the first of a series of on-disk programs that instructs end users on using selected MEDLARS databases. "MedTutor" deals with Medline access. Designed for self-instruction of both search professionals and new users, it carries students through basic data elements, MeSH headings, search limiters, and other search topics. The softwares run on an IBM PC or compatible; no modem is required. It costs $25 plus $3 shipping and handling and is available from NTIS (5285 Port Royal Road, Springfield, VA 22151-9990; order no. PB88-157219).

MEDLARS databases vary greatly in their costs. At the high end are the chemical and toxicology databases with charges of $133 per hour for *Toxlit*, for example, and $94 per hour for *Chemline*. At the other end is Medline, which, as mentioned, costs just $22 per hour. For an experienced searcher, or someone using Grateful Med, that translates to between $3 and $5 per search, often less if the topic is sufficiently narrowed beforehand.

Table 1. Examples of Medical Databases (Continued)

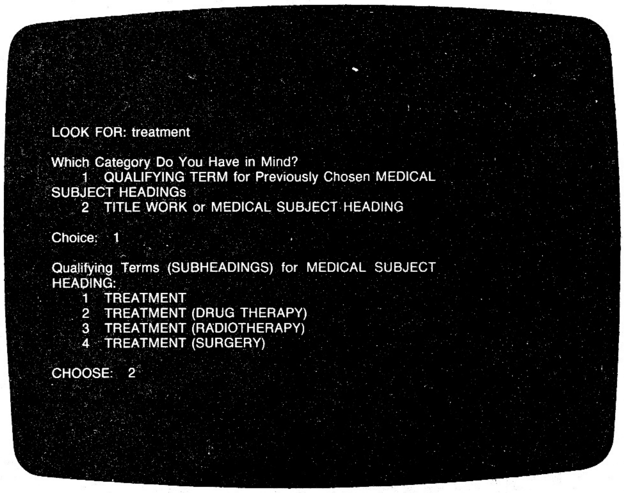
Health	NLM	Bibliographic information on nonclinical issues in health care delivery. Subjects include administration, planning, and personnel. Updated monthly.
Health Devices Sourcebook	ECRI	Database of addresses and marketing information for North American companies that sell more than 4,000 classes of medical devices from about 6,000 manufacturers. Updated annually.
Medline	NLM	Bibliography of biomedical references. This is probably the premier medical on-line resource for most researchers. Contains 6 million references from 3,200 journals. Twice monthly updates of up to 25,000 records.
MESH Vocabulary	NLM	Medical Subject Heading dictionary. A thesaurus of biomedical terms. Also available in printed form, which most searchers use.
Scisearch	ISI	Bibliography of international, multidisciplinary topics including biochemistry, biology, biomedical sciences, medicine, and psychiatry. Information from 4,500 journals. Updated weekly.
Smoking and Health	OSH	Bibliography of scientific and technical literature about smoking, tobacco, and tobacco use. Updated every two months.
Toxline	NLM	Bibliography covering toxic effects of drugs and other chemicals. Updates monthly.

A Sample Grateful Med Search

Using Grateful Med, let us walk through a sample search. Let us suppose you or someone you know has been diagnosed as having a specific kind of recurring headache called "cluster headaches" (a type of migraine headache). After we start Grateful Med, it presents a series of explanatory screens. Then it asks for the area we wish to search. We will examine the most recent Medline file, the 1988-1990 collection (files are grouped in three-year groupings).

After we specify the file, Grateful Med displays an "electronic index card" with several fields of information available for input.We can search

Figure 5.
Clarification of "Treatment"



```
LOOK FOR: treatment

Which Category Do You Have in Mind?
     1  QUALIFYING TERM for Previously Chosen MEDICAL
SUBJECT HEADINGs
     2  TITLE WORK or MEDICAL SUBJECT HEADING

Choice:  1

Qualifying Terms (SUBHEADINGS) for MEDICAL SUBJECT
HEADING:
     1  TREATMENT
     2  TREATMENT (DRUG THERAPY)
     3  TREATMENT (RADIOTHERAPY)
     4  TREATMENT (SURGERY)

CHOOSE:  2
```

on author names, title words, several subject fields, or MeSH words. To find the exact indexing words for "cluster headaches," we type in "cluster" and press F10 to summon the on-line thesaurus. We find that "cluster headache" is an accepted search phrase, so we select that from the list presented. Then we exit the thesaurus and find that the MeSH has automatically plugged "cluster headache" into our search card. We move down to the next set of input fields and further restrict our searching to "English language" journals only and "Review" articles by placing an "X" in these fields. Finally, Grateful Med asks if we want to limit our search to one publication. If needed, a list of the accepted abbreviations for the available journals can be called up and searched on. We bypass this step and are now ready for Grateful Med to carry out our search. Finally, Grateful Med asks if we want to retrieve abstracts, if available, and whether we want to start the search.

Once these steps are completed, Grateful Med goes into "automatic mode" and carries out our search. It calls our access number, translates our search request into recognizable commands, collects our "hits," and stores them to disk. As you can see, the command sequence is simple and precise. The search is carried out quickly and efficiently. The typographical errors that might enter into a manual search are eliminated.

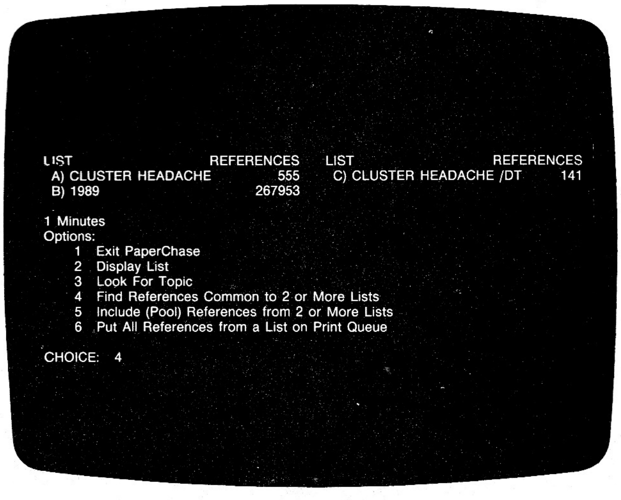
Grateful Med does have a few limitations. First, you can only do one search at a time. To do a second search or to change databases, you have to disconnect from MEDLARS, formulate a search, and redial. Some useful search techniques that experienced users might use are not available from Grateful Med. Still, Grateful Med is the best way for the occasional user to search the system with maximum speed and ease.

PaperChase

PaperChase (PCH) was developed as a simple project to electronically catalog the contents of the medical department teaching files at Beth Israel Hospital in Boston. It rapidly expanded to include the journal resources of the hospital's library. Today, it is a software interface that simplifies access to the complete Medline database. It still serves the needs of Beth Israel's hospital staff but has opened its door to subscribers worldwide.

PaperChase's attraction as a network for Medline searching is its smooth, simple, almost "artificial intelligence" interface. The system is menu driven and offers useful suggestions on improving a search throughout the process. On-line help is always available. It also provides a document retrieval service that supplies full-text versions of any references. Another unique feature is that PCH segments its collection into two journal groups. The "Core" medical journals represent 400 of the most popular journals, that most medical reference libraries likely subscribe to. The remaining journals, which may be obscure, foreign publications, are the noncore journals. When a search result is displayed, you can elect to see the core journal titles first. This improves your chances of

Figure 6.
PaperChase Search Options

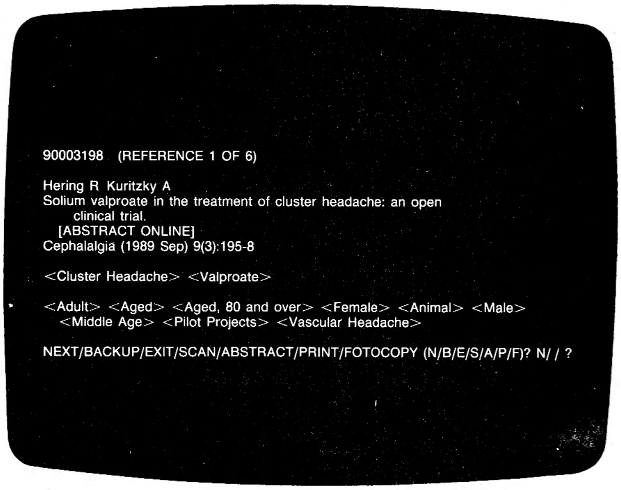


```
LIST                      REFERENCES   LIST                    REFERENCES
 A) CLUSTER HEADACHE             555    C) CLUSTER HEADACHE /DT       141
 B) 1989                      267953

1 Minutes
Options:
     1  Exit PaperChase
     2  Display List
     3  Look For Topic
     4  Find References Common to 2 or More Lists
     5  Include (Pool) References from 2 or More Lists
     6  Put All References from a List on Print Queue

CHOICE:  4
```

Figure 7.
Sample Document from PaperChase



```
90003198  (REFERENCE 1 OF 6)

Hering R  Kuritzky A
Solium valproate in the treatment of cluster headache: an open
     clinical trial.
   [ABSTRACT ONLINE]
Cephalalgia (1989 Sep) 9(3):195-8

<Cluster Headache> <Valproate>

<Adult> <Aged> <Aged, 80 and over> <Female> <Animal> <Male>
   <Middle Age> <Pilot Projects> <Vascular Headache>

NEXT/BACKUP/EXIT/SCAN/ABSTRACT/PRINT/FOTOCOPY (N/B/E/S/A/P/F)? N/ / ?
```

finding full-text copies at your institution. Institutional subscribers can set up their own list of core journals from their library's contents, so they can narrow their searches to references available locally.

A Sample PaperChase Search

To explore PCH's capabilities, let us use it to perform a simple search. After connecting to the system, we are presented with the opening menu. When starting a new search, you will note that PCH also stores previous searches you have done, making them available for six months. Further, it automatically updates old searches as new materials are added to PCH. Other options on the opening menu are self-explanatory.

Throughout your search, PCH suggests your most likely next option. It shows this at the "CHOICE:" prompt followed by two slashes. In the opening menu, for example, PCH assumes you want to start a new search. You can pick the default option by pressing RETURN on your keyboard.

PCH next drops into the search entry mode. Your prompt changes to "LOOK FOR:" and you enter your first search term. Enter the term as you know it and PCH interprets it and present terms recognized by its indexing system. In our example, there were two interpretations available. We selected the first.

It then presents another "LOOK FOR:" prompt to form a second list of references. We choose to limit our citations to papers published in 1989, so we enter "1989" at this prompt. PCH asks for clarification: Do we want 1989 used as a title word, a year of publication, or an update month? We designate it as publication year. PCH then forms our second list of citations. At the third "LOOK FOR:" prompt, we specify papers dealing with "treatment."

When we are finished entering search terms, we press RETURN at the next "LOOK FOR:" prompt.

To find references that fit our three criteria, we want to use the Boolean "AND" operator. A fourth list consisting of six citations that fit our specifications is formed. Still another menu displays our available lists and we can now display them (Option 2).

We can see the abstract (note we are told that one is available), request a "fotocopy" of the full text, or "scan" the remaining titles in this list not stopping between each one. After viewing your list, exiting prompts PCH to provide a list of topics related to your search for future use. Finally, PCH shows our search cost, including a breakdown for connect, telecommunications, and display charges. A typical search costs less than $5 and takes less than 10 minutes.

PCH is an excellent resource for the on-line searcher who lacks the skills needed to manipulate command-driven Medline interfaces. Its well-conceived menus, full range of options, and coverage of Medline's complete contents make it an attractive choice for Medline searching.

Other Access Routes

DIALOG Access

DIALOG Information Services offers over 300 databases covering a broad range of disciplines. A few of DIALOG's databases covering medical and bioscience disciplines are listed below.

Biosis Previews
Cancerlit
Clinical Abstracts
De Haen Drug Data
Drug Information Fulltext
Health Planning Administration
Life Sciences Collection
Biotechnology Abstracts
Chemical Exposure
Current Biotechnology Abstracts
Diogenes
Embase
International Pharmaceutical Abstracts
Martindale On-line

Table 2. Medical Information Providers

ASHP
American Society of Hospital Pharmacists
Database Services
4630 Montgomery Avenue
Bethesda, MD 20814 (301) 657-3000

BIOSIS
Biosis
Education and Training Group
2100 Arch Street
Philadelphia, PA 19103-1399 (800) 523-4806, (215) 587-4847

C.I.
Cumulative Index to Nursing & Allied Health Literature Corp.
P.O. Box 871
Glendale, CA 91209-0871 (818) 409-8005

ECRI
Online Customer Service
5200 Butler Pike
Plymouth Meeting, PA 19462 (215) 825-6000

EM
Excerpta Medica
North American Database Dept.
Elsevier Science Publishers
52 Vanderbilt Avenue
New York, NY 10017 (800) 457-3633, (212) 916-1161

FOI
FOI Services, Inc. & Washington Business Information, Inc.
Diogenes
12315 Wilkins Avenue
Rockville, MD 20852 (301) 881-2100

ISI
Institute for Scientific Information
3501 Market Street
Philadelphia, PA 19104 (800) 523-1857, (215) 386-0100

BRS and BRS Colleague
Maxwell Online/BRS
800 Westpark Drive
McLean, VA 22102 (703) 442-0900

MIS
Medical Information Systems
Reference & Index Services, Inc.
3845 N. Meridian Street
Indianapolis, IN 46208 (317) 923-1575

NIOSH
National Institute for Occupational Safety and Health
Technical Information Branch
4676 Columbia Parkway
Cincinnati, OH 45226 (513) 533-8317

NLM
National Library of Medicine
Specialized Information Services
8600 Rockville Pike
Bethesda, MD 20894 (301) 496-1131

NTIS
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road
Springfield, VA 22161 (703) 487-4600

OSH
Office of Smoking and Health
Technical Information Center
Park Building, Room I-16
5600 Fishers Lane
Rockville, MD 20857

PCH
PaperChase
Longwood Galleria
350 Longwood Avenue
Boston, MA 02115 (617) 732-4800

Medline	Mental Health Abstracts
The Merck Index On-line	Nursing & Allied Health (CINAHL)
Occupational Safety and Health (NIOSH)	Pharmaceutical News Index
Sedbase	Smoking and Health
Sport	Zoological Record

Several other DIALOG databases, not considered health or medical files, include information that is applicable to certain situations. Although these databases are targeted more to business professionals, they often include information that could be useful to the medical topic searcher and cover biotechnology, nutritional, and food microbiology topics.

Going through Information Producers

Many of the databases DIALOG, BRS, and other on-line services offer are also available directly from the database producer (sometimes referred to as an "information provider" or "IP").

There are advantages and disadvantages to securing data from an on-line service instead of going directly through the producer.

The obvious advantage of a service such as DIALOG is its "one-stop shopping" nature. In addition to Medline and many of the other NLM databases, you also can find related information from other providers.

Trends

Several trends characterize the medical information field.

Lower Access Charges

The cost of on-line access is decreasing as providers combine databases and increase transmission speed.

More End-User Tools

End-user tools such as the NLM's Grateful Med and improved interfaces from the vendors themselves (DIALOG's "Medical Connection" and Maxwell/BRS's "Colleague" subsystems are two examples) are making highly technical information available to a much broader range of users. Physicians and other health care professionals are doing their own searches with increasing frequency. The popularity of electronic information access has led the nation's largest medical society, the American Medical Association, to offer its own database service—"AMA/Net"—complete with a gateway to PaperChase, an on-line emulation of Grateful Med for Medline access, and dozens of other services.

Information Has Become Democratized

Institutions that previously catered only to medical professionals now do on-line searching for anyone willing to pay a modest fee for the service.

CD-ROM Is Catching On

We will see an increase in the number of databases available in CD-ROM format.

Most providers offer good documentation, training courses, telephone support, and special training materials, so the number of obstacles to getting into on-line searching, even for highly technical subjects such as medicine, is greatly reduced. Electronic access to medical information is rapidly becoming a consumer-oriented business that will continue to attract a wide range of users and interests. ■

Working with Information Brokers

In this report:

What Information Brokers Do .... -103

On-Line Searching.... -104

Examples of Questions Researched .... -105

Working with Information Brokers .... -106

Characteristics of Information Broker Services .... -108

Tracking Down Information Brokers . -109

Conclusion .... -110

This report will help you to:

- Decide why a company would need an information broker.
- Discover the services information brokers offer.
- Outline typical charges and find the right information broker for your company.

Information brokers sell library, research, and information services for a fee. Typical services include on-line database searching, public record searching, document delivery, consulting, and traditional library-related tasks such as cataloging and indexing. Information brokers offer companies a cost-effective alternative to handling these tasks in-house; they can also fill in when staff members are out or otherwise occupied.

This report describes why a company would need an information broker. It describes the services information brokers offer and how to work with brokers to obtain the best return on investment. It outlines typical charges and includes pointers on tracking down information brokers.

Report Highlights

- What Information Brokers Do
- Working with Information Brokers
- Characteristics of Information Broker Services

The number of information brokers (also known as free-lance librarians, information retailers, information specialists, information consultants, etc.) is growing about 30 percent per year. There are now more than 1,700 companies and libraries in the U.S. alone that provide information-on-demand and related services. This growth is due to the microcomputer's popularity, the proliferation and general acceptance of on-line databases, and the increasing awareness of information's value.

Why Hire an Information Broker?

Companies in fast-moving industries such as health care, computers, robotics, and other high-tech fields depend on up-to-date information because their fields change so quickly. For these companies, keeping up with shifting trends and new developments is a must. Even on-line databases may not be current enough for some topics. In these cases, identifying and interviewing experts may be the best way to discern trends and the latest developments. All companies, however, from *Fortune* 500 giants to one-person operations, need information to make informed decisions. Consequently, many companies, particularly large ones, have in-house libraries, information centers, or other resources for tracking down information. Occasionally, these resources are unavailable or insufficient for valid decision making.

Enter the information broker. At some time, companies of all sizes may need an information professional. Large corporations use information brokers when in-house librarians are on extended leaves or to handle work load surges. They also use them for secrecy, to prevent the disclosure of confidential plans. Recently, some corporations have reduced the number of professional librarians on staff or begun to staff corporate libraries with less educated individuals to cut costs. Some have closed their corporate libraries, selling the books and journals to former employees, who form private companies to provide them with library and information services on a contract basis while simultaneously seeking additional clients.

Small or mid-sized companies may hire information brokers because they lack in-house libraries or computers for on-line searching or because they need an information specialist with expertise in a particular subject. Individuals such as speech writers, authors, and consultants use information brokers when they need research assistance.

The following section explores in-depth reasons for hiring information brokers.

No In-House Capabilities

Most businesses turn to outside help when they do not have the time or resources to handle a given task themselves. Traditionally, this has applied to management consulting or similar functions. Now, this also applies to information gathering. Businesses of all sizes need information, but not every company can support a full-fledged library, complete with librarian, print materials, and the computer resources to retrieve information electronically.

In particular, a company that does not make use of computer databases is seriously handicapped. On-line databases open up a world of information unimagined only a generation ago. And with the speed of microcomputers, millions of records can be sifted in seconds, to extract the needed kernal of data. But small and even medium-sized businesses must decide whether paying for the hardware, software, and people necessary to conduct searches and maintaining subscriptions to database services is cost effective. In some cases, it may not be, especially if crucial information is needed only occasionally. Even if they have the financial resources, many companies do not want to bother buying the necessary equipment and hiring someone to conduct on-line searches. Here is where information brokers may help.

The choice of database can greatly affect the result of a search. It is the broker's business to keep up with new products and services. A company employee may not have the time, expertise, or inclination to evaluate and select the best from the plethora of available databases.

Help in a Pinch

A company also might hire an information broker because its own staff is too busy to handle a given project. In other cases, the staff librarian may be on vacation or an extended leave or may be unfamiliar with a specific area the company is exploring. Or the usual resources, such as local libraries, may not be suitable for a particular project. Many libraries, for example, do not offer on-line searching; they still rely entirely on print or microfilm. Compared to what is available on-line, these sources are often outdated. If information must be current, a computer search is often the best option.

Even companies that are "on-line literate," however, and subscribe to services such as NewsNet, NEXIS, or Dow Jones News/Retrieval, may need to hire information brokers. Occasionally, esoteric databases, available through more specialized services, must be tapped. It would not pay to keep accounts open with many on-line vendors just to handle these occasional demands. Another reason for such companies to hire information brokers is to ensure that their own on-line research is complete.

Researching Specialized Topics

One popular reason for hiring an information broker is to gather information in a specialized area, quickly. Often, businesspeople find they need instant expertise in unfamiliar subjects. In most cases, an information broker could gather more information on a given topic than could specialists in that field. Some information brokers are highly educated and experienced subject specialists who have become entrepreneurs. It especially makes sense to consider a broker when researching fast-moving fields, such as genetics or high technology.

Business Economics

In some cases, companies hire personnel or use existing staff to handle certain work but can use outside consultants. This may reflect how they perceive certain employees' skills or an edict to keep the employee "head count" to a minimum. For instance, some law firms do not bill librarian research services to their clients. They do, however, justify billing information brokers. Therefore, it may pay to hire a broker rather than use in-house personnel for research. At times, the broker will be asked to submit a bill for "consulting services" rather than the more specific description "information research."

Anonymity, Convenience

Sometimes, businesses use information brokers to ensure anonymity. This is not because they are engaging in unethical practices, but as a protection against letting competitors in on new directions the company may be taking. For example, if an information broker files a Freedom of Information request with the government, the broker's name, not that of the ultimate user of the information, is included on the documentation. Another aspect of obtaining information from the U.S. government involves bureaucracy and paperwork. Some information brokers make a specialty of dealing with the government for clients because they know how and where to locate the information and have the staff and perseverance to follow through on what may be a tedious and complicated process.

Professional versus Amateur Searching

More and more executives, managers, and other end users now do their own on-line searches. Previously, these people had assistants or company librarians handle research projects. But, thanks to aggressive marketing of easy-to-use on-line services such as InfoMaster and CompuServe, these users have been enticed to go on-line themselves. Menu-driven front-end software packages such as DIALOG's Knowledge Index have also exposed people lacking formal training in on-line searching to on-line databases.

Thus equipped, does it make sense for such people to contract with information brokers? In some cases, yes. While front-end software packages and menu-driven services offer an easy entrée into on-line information, they are no substitute for the knowledge and experience professional on-line searchers offer. Even with these aids, part of the on-line world remains closed to end users.

Some systems are difficult to use cost effectively and require extensive training. Their databases can require specialized knowledge for effective searching. Patent databases, chemical-related databases, and legal databases fit in this category.

Many databases charge high access charges. Thus, you could be wading in some pretty expensive waters if you do not know your way around. Even databases used for business research are expensive. Consequently, for a job that entails a lot of computer time, it may actually be cheaper to hire a broker who can conduct the searching more adroitly.

Other databases are not well publicized and are relatively unknown outside of the information business. An end user does not always know the best on-line sources. While they may enjoy the process of going on-line, end users are not full-time searchers. For engineers, chemists, public relations executives, managers, etc., research is only a part of the job. For professional librarians/information scientists, however, research strategy, on-line searching, and choice of subject-specific reference tools is a significant part of their graduate school curriculum.

What Information Brokers Do

Information brokers handle many tasks, from abstracting to writing.

Many large information brokers offer a range of services, such as:

- Document Delivery
- Competitor Information

- Database Searches
- Demographic Data
- Government Reports
- Industry Services
- Legal Literature Searching
- Medical Literature Searching
- Patent Services
- Research in All Subjects
- Translation Services
- Public Records Information

Of these services, on-line searching and document delivery are the most popular. Closely behind these are general researching and consulting. Some companies may specialize in narrow areas such as patent research, where searching for and providing copies of printed and graphic data constitute the bulk of the company's activity.

Descriptions of the more common services information brokers offer follow.

On-Line Searching

Searching on-line databases is what information brokers do the most. With more than 4,500 databases available and a steep learning curve involved, most business people cannot be bothered to go on-line themselves. Many information brokers search every day, have invested the time and money to train in the use of databases, and presumably know how to get in and out of a database at the least possible cost.

Instant Education

Often, a client will ask an information broker to "give me everything you have on solar energy" (or biotechnology, gene splicing, etc.). In effect, the broker is asked to instantly educate the client on a given subject. To fill such a request, the information broker might turn to books, articles, conference proceedings, studies, interview transcripts, and other materials to bring the client up to speed on the subject. A bibliography might result, supplemented by the actual materials (document delivery).

Current Awareness Services

Occasionally, a client may have an ongoing need for information on a particular subject. In those cases, a business may hire a broker on a long-term basis to regularly scan the literature and provide periodic updates on that subject. Such updates can include a bibliography of the latest research findings, articles, or books published on a subject, or they may actually summarize these works. Some on-line vendors will run a search automatically, at regular intervals, and deliver search results electronically or in hard copy. Law firms, for example, now regularly incorporate this service in litigation activity or as a means of continuing education for attorneys.

Market Research

Many businesses turn to information brokers for market research. This can involve providing quick answers to specific questions, such as "How much steel did Japan produce in 1987?" Or, at the other end of the spectrum, it can call for complete industry studies for companies thinking of entering a new field or considering a new acquisition. Some information brokers now mail out catalogs listing "canned" market research studies for sale. Prices may vary from $150 to several thousands of dollars.

Competitor Intelligence

Companies frequently hire information brokers to get product samples, pricing or service data, or other information from their competitors. While many companies perform this work using employees, it has become one of the fastest-growing areas of activity for information brokers! One large broker once worked for both the plaintiff *and* the defendant in a lawsuit.

Other Tasks

Most information brokers search databases for a fee. But they also do many other things. For example, Sue Rugge, founder of Information on Demand (IOD) and now president of The Rugge Group, recently described a project that started out as an ordinary request for recall information on BMW 1600s with faulty gas tanks, but which ended up with The Rugge Group providing a BMW and a stunt driver to roll it at 35 miles per hour!

Because they are often professional librarians by training, information brokers also handle traditional library tasks on a free-lance basis. Examples of such tasks include cataloging; indexing; collection appraisal; and library automation, management, and operations. Companies often hire brokers to weed through, organize, and catalog library collections. An information broker might also consult, helping a company pinpoint the optimum mix for its needs from among the many information tools available. The broker's recommendation might call for a combination of CD-ROMs, on-line databases, and hard copy (print) resources. It is also possible to break down research methods by the subject under investigation. Scientific research is done primarily through computer searches and libraries, according to one prominent information broker. Business research, which is usually marketing oriented, involves more direct-contact interviews.

Some information brokers have broadened their list of services by popular request. Repeat business is the successful information broker's bread and butter. When a relationship has been established and the client trusts and respects the broker's capabilities, it is not unusual for that client to ask about additional services that are needed.

Document Delivery

"Document delivery" is information industry jargon for supplying the goods unearthed by research: the actual articles, books, maps, diagrams, patents, etc. An essential complement to information brokering, document delivery is usually article delivery. A bibliography does not help a client if the articles listed appeared in esoteric journals housed in far-flung libraries. Indeed, tracking down articles is rarely as simple as stopping by the company library or even the local public or college library. Thousands of journals, magazines, and newspapers are published worldwide. Each year, 50,000 new books are published in the U.S. alone. No one library can house them all. If that timely, essential article you need is published in "Obscure Quarterly," you may have trouble getting your hands on it in time for it to be useful. This is where document delivery can help.

Most information brokers offer document delivery as part of their overall services. There are also companies that specialize in document delivery and those that specialize in delivering certain types of materials such as government documents.

These companies have runners on staff, located at key libraries (e.g., the Library of Congress). The runners photocopy the material, then send it directly to the client or broker. As part of their services, document delivery firms cover copyright royalties through regular payments to the Copyright Clearing Center (CCC).

Most document delivery services charge from $6.50 to $15.00 per article, regardless of its size. Some charge by the page. Turnaround, of course, hinges greatly on the client's proximity to the company, but many services offer a "rush" option.

Locating a Document Delivery Service

An information broker is probably the best place to turn if you are looking for a document delivery company, since most offer this service. Or, if you subscribe to an on-line service, check with its customer service department. Many on-line services have arrangements with document delivery services.

DIALOG subscribers, for example, can order hard copies of documents unearthed through searches *while on-line*, through its *Dialorder* service. The requester chooses a document delivery service based on descriptions in DIALOG's "Yellow Sheets." Each sheet describes the scope of services the document delivery firm offers and typical charges and terms. It also gives contact information. The user enters the ordering information while still on-line; it is then sent electronically to the document supplier.

Information America, a rapidly growing Atlanta-based public records information company, allows searchers to order certified copies of important documents from state or county sources from a menu. Cost for the document retrieval service is included as part of subscribers' monthly bill.

Finally, database producers can often supply copies of the articles referenced in their databases. Producers that do this include UMI/Data Courier, Chemical Abstracts Service, Information Access Company, and the Institute for Scientific Information (ISI).

Examples of Questions Researched

Information brokers report they can be asked just about anything. For example, one Texas-based broker recently finished a sizable research project on parrot fever. A lawyer's client had contracted the disease and was considering suing the pet store from which he bought the parrot. The lawyer needed to know a lot about the subject in a hurry. The broker began by researching the subject the old-fashioned way: looking it up in an encyclopedia. She then searched several medical databases, including *BIOSIS*, *Medline*, and *Embase*, for things such as long-term effects. She distilled this research into a bibliography and one-page summary for which she received approximately $250. (She never learned whether the lawyer decided to sue.)

Following are examples of questions that Find/SVP, the oldest and largest information broker in the U.S., has answered.

- Does ad cutting exist in the newspaper business, and if so, what are the recent trends?
- What ad campaigns has *McCall's* magazine run for itself in the past few years?
- What data exists on why parents send kids to prep schools?
- Is anyone actively promoting the sale of milk in glass bottles?
- What are the leading men's fashion magazines in Japan? Get sample issues.
- Could you find the names of some marketing consultants for the restaurant industry?
- What major articles have been written in the business press on fast-food chicken restaurants in the past five years?

A Case Study

Massachusetts-based Information & Research Brokers Of New England specializes in business research. Here is a research project that is typical of what the company handles.

A start-up company received a patent on an exciting and potentially effective product. At the same time, it was likely to encounter resistance from the industry to which the product was targeted. This new product could reverse the damaging effects of certain pollutants in our environment. Despite the potential benefits, the target industry, consisting primarily of conglomerates, had valid reasons to be less than receptive to this new product and its technology. Huge investments had been made in competing technologies within this industry. Also, many resources had gone into lobbying lawmakers and government officials at various levels to sway public opinion and pending legislation that specifically dealt with this particular subject.

In brief, the firm needed to know who the key players in this target industry were and which of them were more likely to like this product and its associated technology. Approaching the wrong player would mean an instant end to the product's chances of penetrating this market. Therefore, the research effort involved gathering data to uncover who was producing what and which government organizations were the most critical in this process. With a systematic approach to discreetly collecting this crucial data, the research firm was able to maintain confidentiality, a serious concern for this firm. At the same time, it was able to determine the set of risks this company would have to face and which avenue offered the least risk and the most profit.

Working with Information Brokers

Information brokers, like many consultants, are expensive. To ensure that you get the most for your money, follow these guidelines when working with a broker.

Clear Communication

It is true that when you hire an information broker you are shifting the responsibility for a given project to the broker. But, unless you spend some time accurately defining the information you need, you risk getting worthless information. If you tell the information broker what you need over the phone, ask the broker to write the request down and send it to you for verification, especially if there is a large fee involved.

You should not only tell the broker what information you are looking for, but what form you expect the finished product to take; for example, annotated bibliography, selective bibliography, complete market study, etc. (Most brokers prefer to provide professional-looking reports.) Many brokers supply a form describing the project, including estimated charges and completion date. If time does not permit written verification, have the broker call after the project is started to discuss its progress. In any case where the client's request is not clear-cut, the broker should give status reports while the work is in progress.

Your interaction with the broker does not always end once you have told the broker what you need. Ideally, if a computer search comprises the major thrust of the research effort, you should sit alongside the researcher while he or she does the search. That way, the search can be fine-tuned based on the information that is retrieved. If the broker and client work together from the beginning, the chances that useful information will result are improved.

Setting Deadlines

A time frame is very important. Be sure to tell the broker if you need the information by a certain date and if there is a definite date by which the information will be of no use to you. In setting a deadline, you should be as frank as possible.

It is important to give the broker enough time to do the best job possible. Some clients say they need the information before they really do. In addition to risking the chance of getting less than comprehensive results, these clients may incur a rush-job surcharge.

One experienced user of information brokers recommends setting a deadline that will give you enough time to get the work done elsewhere, especially when using a broker for the first time. That way, if the arrangement does not work out, you are not caught in a bind.

Confidentiality

Information brokers are often asked to handle confidential research. Obviously, if a company is thinking of entering a new market or acquiring another company, it does not want that information disclosed. Brokers recognize the importance of confidentiality and usually acknowledge its importance up front. Every employee of Texas-based Burwell Enterprises, for example, signs a confidentiality agreement stating they understand that client-related matters are confidential. Find/SVP specifies in its literature that it respects secrecy.

Fees

Information brokers advise clients to discuss money matters up front. The client should have a clear idea how much the project will cost. A budget should be determined, with the broker directed to stay within it or to get back in touch with the client.

Retainers

Some brokers, especially the larger ones such as Find/SVP, work on a retainer basis. Find/SVP's clients, termed "information cardholders," pay a monthly fee, worked out in advance. Initially, reports the company, "most client retainers are between $375 and $750 a month, plus out-of-pocket expenses." The money is applied to research fees, normally charged at $40 to $150 per hour. The company's Strategic Research Division, which tackles more in-depth projects such as competitive intelligence studies, charges from a few thousand dollars to $100,000 or more.

Flat Fees

Most brokers, however, travel in different circles. Smaller information brokers charge by the hour but will give firm quotes. These hourly rates range from $20 to $100 per hour. Others set flat fees per project. The specific fee usually varies with the type of work, who is doing the work, and the going rate in the area. Naturally, rates in New York City and Washington, DC are higher than those in mid-America.

Also, "professional" skills command more money than simple article retrieval and other jobs demanding primarily clerical skills. In addition, fees hinge on whether value-added services are included (e.g., analyzing the results of searches). As more and more subject specialists enter the field, brokers are increasingly providing these value-added services. Even those who are not subject specialists themselves may hire one to analyze the materials their research has uncovered if the client wants such analysis performed. In addition to the per-hour fee for the broker's time, database access fees and charges for postage, telephone calls, fax services, and other incidentals are also figured into the bill.

On the surface, do-it-yourself research may appear much cheaper than using an information broker. In the long run, that is rarely the case. It could take an employee days or weeks to duplicate the research a broker can often do in hours. (That is assuming an employee could be spared for that long.) Information brokers are professional information retrievers.

Characteristics of Information Broker Services

While a great many information brokers have library/information science (MLIS) degrees, some people who were trained as engineers, lawyers, and even bankers are now information brokers. Their strong subject backgrounds make them expert information sleuths. The lack of an MLS degree, therefore, does not necessarily mean a broker is unqualified. The Association of Independent Information Professionals (AIIP), which is developing standards for the profession, does not insist that its members have MLS degrees. (But it does plan to set some sort of educational standard.) The group has accepted a Code of Ethical Business Practice, to which its members adhere.

"Mom and Pop" Operations

Many information brokers are one- or two-people operations. Even Find/SVP, the largest, has billings of less than $10 million a year. While it may be cheaper to hire a smaller company, its resources may be limited. That is, small companies may not have access to as many databases, other in-house resources, or even libraries as a larger concern would. Some on-line vendors, for example, charge monthly subscription fees, which smaller concerns may not be able to afford.

Smaller information brokers, however, may make up for limited resources by subcontracting some of their work out. They parcel out assignments to other brokers who have experience, contacts, or resources in fields in which they do not.

Large Companies

New York City's Find/SVP is perhaps the best-known and certainly the largest U.S.-based company dedicated solely to information-on-demand services. Find/SVP's resources include 206 professionals, who work out of what the company claims is the largest business information center in America. This includes more than 11,000 subject files; company files; and current and back issues of more than 2,000 business, trade, and consumer periodicals. The company also accesses 1,000 databases, conducting more than 10,000 searches annually. It is also plugged into a network of SVP information brokers, which spans 17 countries.

Libraries as Information Brokers

Increasingly, some larger public and academic libraries (e.g., the Free Library of Philadelphia, Cornell University, and the University of Arizona) are providing information-on-demand services. Libraries can charge less than a commercial information broker, since they are often subsidized. Your chances of paying less when going through a library-based information broker increase if you live in the community served by the library or, in the case of academic libraries, are a student or faculty member there.

The Free Library of Philadelphia's Computer-Based Information Service—A Case Study

The Free Library of Philadelphia has been in the information broker business since 1975. Its information-on-demand services consist almost entirely of on-line searches. Requests for these searches are phoned in, mailed in, or "walked in" to its Computer-Based Information Center (CBIC), which has a staff of four librarians. The CBIC primarily serves residents of Philadelphia, although it also receives requests from other areas. Requesters typically want information on local politicians or local companies for market research purposes.

Before going on-line, a CBIC staff member interviews the patron concerning the information wanted, the research done so far, sources the information is likely to be found in, the level of information wanted (technical, general), how much money he or she can spend, how current the information has to be, and whether full text is wanted. The center's policy is that searching is done on a confidential basis.

The database that the CBIC taps most often is *The Philadelphia Inquirer*. Following that is another Philadelphia newspaper database, *The Daily News*. Other databases often searched include *Magazine Index*, *National Newspaper Index*, *ERIC*, *PTS Promt*, *Trade and Industry Index*, *D&B Market Identifiers*, *Newsearch*, *ABI/Inform*, *NTIS*, *Business Dateline*, and *Investext*.

Specializing

While most brokers still say they will handle any assignment, many now specialize. Popular specialties include chemistry and pharmaceuticals, patents and trademarks, management consulting, advertising, and legal research. There are also information brokers who specialize in showing others how to enter the business. Sue Rugge, for instance, shares her experiences via two cassette tapes, which she markets from her home. She travels the country annually, offering seminars in major cities. Online Connection, a firm run by a veteran information broker, helps companies establish in-house computerized search centers.

Tracking Down Information Brokers

Hiring an Information Broker

Booming businesses, especially those needing little in the way of start-up capital, attract people of varying abilities and backgrounds. The information broker business has certainly attracted its share of people with get-rich-quick dollar signs dancing in their eyes, but little in the way of useful experience. One broker says that each time her company and publications about information brokering are mentioned in national magazines, up to two dozen calls or letters follow, with inquiries from individuals interested in getting into what *New Business Opportunities* magazine recently described as one of the "ten hot new businesses for the nineties." Enticed by books and articles describing "How to Make Money with Your PC," they have been told that information brokering is an easy business to get into.

And it is. But that does not mean that it is an easy job to do well. Longtime information consultant Sue Rugge advises clients seeking a broker to interview carefully. Prospects should make clear just what qualifies them to handle the task at hand. The client should look for brokers who belong to one or more of the relevant trade associations, such as the Association of Independent Information Professionals, Information Industry Association, Special Libraries Association, or American Library Association. Beware of those who charge significantly less than the going rate. Ask for references and check them. Also, determine what database services they subscribe to. If DIALOG, in particular, is not mentioned, be wary.

Accreditation would simplify the hiring process. To date, however, brokers have not had to meet any formal standards to enter the business. The Association of Independent Information Professionals (AIIP) was formed, in part, to deal with this problem. The organization sees itself as doing for information brokers what the American Bar Association does for lawyers and the American Medical Association does for doctors.

That aside, how do you track down information brokers? Word of mouth is certainly one of the best ways. Has anybody in your circle of business acquaintances ever worked with an information broker? If not, you may be forced to strike out on your own.

The *Yellow Pages* may now be of some help. Several of the "Baby Bell" regions now have a heading for "Information Brokers." Other possible headings include *Information Service* or *Information Bureaus*, but companies listed there may not actually be information brokers. Brokers try to avoid the heading *Library Research Services* whenever buying advertising space because the public tends to look under that heading to find the local public library's reference service. Other options for locating brokers include contacting a university library or a city's public library. Colleges offering information science or library curriculums may also be helpful.

Broker Directories

Directory of Fee-Based Information Services. The current edition lists over 800 information brokers. The directory is published by Burwell Enterprises, 3724 FM 1960 W., Suite 214, Houston, TX 77069. Updated annually, the 1990 edition costs $49.50, plus $3.00 postage and handling. Another Burwell Enterprises publication, *Information Broker*, is a bimonthly newsletter by, for, and about the subject of information brokering. Each issue lists six to eight new or newly discovered information brokers and includes articles on working with information brokers and new information sources. A subscription costs $35 per year.

Information Sources. Published by the Information Industry Association (IIA), this publication provides in-depth corporate profiles of IIA member companies, some of which provide information-on-demand services. The 1990 edition is available for $45.00 to member companies and $99.95 plus $6.00 for postage and handling to nonmembers. Order from Information Industry Association, 555 New Jersey Avenue, NW, Suite 800, Washington, DC 20001.

Online Database Search Services Directory. Published by Gale Research company, this publication describes 1,700 companies and libraries providing information-on-demand services. Order from Gale Research Co., Book Tower, Detroit, MI 48226.

Conclusion

Just as a plumber should not be called in every time a faucet is leaking, a business would not want to hire an information broker every time a research problem appears. There are times, however, when both plumbers and information brokers are worth every penny, assuming the job is done right. It is hard to put a price tag on the peace of mind that comes from knowing a task is expertly handled. This is especially the case when that task involves something as important as gathering information. ■

Accessing Second-Tier Information Utilities

In this report:

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This report will help you to:

- Learn about four important but relatively unknown on-line information services.
- Understand what these services cost and how to access them.
- Learn about computer conferencing, "free" software, and other offerings from second-tier services.

The WELL

Just beneath the tier of major information utilities there exists a group of smallish commercial services that do not offer all the service of a big system like CompuServe, but instead offer specialized subsets of interest to many users.

The most important system is the WELL. Started in 1985 by Whole Earth and Network Technologies (NETI), the WELL was designed as an inexpensive on-line meeting place, and it has been described as a "people's think tank."

There are over 90 WELL conferences. Some are computer specific, others are technical, and some are purely entertainment. Anyone may start a discussion topic in a conference, and topics may be linked between different conferences. The conferences are well organized because every conference has a conference host who organizes and keeps continuity in the discussions.

The WELL has a minimum number of rules which are enforced in a low-key style probably stemming from the many social and cultural elements of the varied membership. Its character comes from an odd assortment of hackers, writers, artists, knowledge workers, fugitives from the counterculture, businessmen, educators, programmers, lawyers, musicians, and many more.

There is a strong San Francisco Bay Area tilt to the WELL, although

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that seems to be changing. There is no advertising in the WELL and no surcharges for any information. The participants work to keep the information accurate and objective.

The WELL's staff often talk on-line to their users. They keep track of who's logged. In fact, members of the WELL staff know most of the 5,000 users personally. WELL users and staff have frequent social gatherings, from which many friendships have developed. The WELL also welcomes visitors to its facilities to meet the staff, and take a look at the Sequent minicomputer.

Electronic Mail

The WELL has a fast and sophisticated electronic mail facility. Mail may be sent to an individual or a group. There is also a "send/reply" facility that allows real-time dialogue between users.

Access through the CompuServe Packet Net (CPN)

At this writing you can reach the WELL through CPN. This may reduce the long distance access charges. The rate is $5.00 per hour which is added to your WELL bill. To reach the WELL via CPN, call 1-800-848-8990 and ask for your local CPN number. When you are connected it will prompt:

```
Host Name:
```

Type **WELL** then press the ENTER key. You will be connected with the WELL.

UNIX

The WELL uses the UNIX BSD 4.3 operating system. WELL subscribers have the ability to use UNIX utilities and programs. There are several ways to customize your account. It's also a great place to learn. The UNIX manual is on-line (some specific conferences are devoted to it) and there are some real UNIX hackers logged in much of the time.

UUCP and USENET

The WELL has full access to the worldwide UNIX community through UUCP and Bitnet mail and carries a large selection of USENET news groups. There is a choice of user interfaces for Netnews. The WELL is one of the few places where any individual with a computer and modem can become a terminal in this huge international network that connects universities, businesses, and research institutions.

File Storage and Transfer

As a WELL user you will get up to 500K free file storage. You may create files and subdirectories and your own directory is created when you register. The charge for storage above 500K is $20.00 per megabyte per month. File transfer facilities include Xmodem, Kermit, and XON/XOFF.

Direct Access, Modem Speed, and Settings

For direct access use one of the following numbers:

Sausalito: 1-415-332-6106 1200 BPS
1-415-332-7217 2400 BPS
East Bay: 1-415-848-0841 1200 BPS
1-415-848-0842 2400 BPS

The default setting on most communications programs is eight bits per character, one stop bit, and no parity. This usually works fine for the WELL. If you see garbage on the screen, switch to seven bits per character and even parity. The WELL supports a large variety of terminal emulations.

Cost

The WELL charges a monthly fee of $8.00. There is also an hourly charge of $3.00, billed to the nearest minute. The rates are among the lowest in the country for comparable facilities. Payment may be made by VISA or MasterCard, but credit card use does require a $25.00 advance payment.

If you live outside of the San Francisco Bay Area you may be able to save substantial money on the phone call by reaching the WELL via CompuServe. The WELL is unique in that it is one of the few places where an individual account has full access to the worldwide USENET and UUCP mail.

For more information call 1-415-332-4335 (voice). To register simply call the WELL's modem number 1-415-332-6106. When you get connected you will see the Logon Banner. Type **NEWUSER** then press ENTER at the prompt. You create your own user ID and password when you register. After your account is established you can reach the WELL directly or through CompuServe or PC Pursuit and also through StarLink. At this writing the

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Datapro Research Group. Delran NJ 08075 USA

WELL can handle up to 16 direct callers and up to 7 callers through CompuServe. In the San Francisco Bay Area there are four direct lines from Berkeley and Oakland, plus three new direct South Bay lines through Pacific Bell's PPS packet-switching network.

Getting Started

To sign up just call 1-415-332-6106 with your modem and type **NEWUSER** then ENTER at the log-in prompt. Or call 1-415-332-4335 if you'd like more information. Their mailing address is: The WELL (Whole Earth Lectronic Link), 27 Gate Five Road, Sausalito, CA 94965.

Conferences on the WELL

The following will give you some idea of the conferences available.

General Conferences

Best of the WELL (g best)

Business and Education Conferences

Classifieds (g cla)
Consultants (g consult)
Consumers (g cons)
Design (g design)
Desktop Publishing (g desk)
Education (g ed)
Homeowners (g home)
Legal (g legal)
Library (g lib)
Stock Market (g stock)
The Future (g fut)
Translators (g trans)
Work (g work)
Word processing (g word)

Social and Political Conference

AIDS (g aids)
Archives (g arc)
Berkeley (g berk)
Central America (g centro)
Drugs (g dru)
Gay (g gay)
Health (g heal)
Irish (g irish)
Jewish (g jew)
Liberty (g liberty)
Mind (g mind)
Men on the WELL (g mow)
Nonprofits (g non)
Parenting (g par)
Peace (g pea)
Poetry (g poetry)
Philosophy (g phi)
Politics (g pol)
Psychology (g psy)
San Francisco (g sanfran)
Sexuality (g sex)
Spirituality (g spirit)
True Confessions (g tru)
Words (g words)
Whole Earth (g we)
Women on the WELL (g wow)
Writers (g wri)

Arts, Recreation, and Entertainment Conferences

ArtCom Elec.Net (g acen)
Audio-Videophilia (g aud)
Boating (g wet)
Comics (g comics)
Cooking (g cook)
Crafts (g craft)
Eating (g eat)
Flying (g flying)
Fun (g fun)
Games (g games)
Gardening (g gard)
Jokes (g jokes)
MIDI (g midi)
Movies (g movies)
Motorcycling (g ride)
Music (g mus)
On the Air (g ota)
Pets (g pets)
Science Fiction (g sf)
Sports (g spo)
Television (g tv)
Weird (go weird)

Grateful Dead Conferences

Grateful Dead (g gd88)
Deadplan (g dp)
Feedback (g feedback)
Tapes (g tapes)
Tickets (g tix)
Tours (g tours)

Computers

Amiga (g amiga)
Apple (g app)
Atari (g ata)
Art and Graphics (g gra)
Computer Books (g cbook)
Desktop Publishing (g desk)
Forth (g forth)
HyperCard (g hype)
IBM PC (g ibm)
Laptop (g lap)
Macintosh (g mac)
Mactech (g mactech)
Microtimes (g microx)
Programmers (g pro)
Programmers's Net (g net)
Unix (g unix)
Word Processing (g word)

Technical and Communications Conferences

Info (g boing)
Media (g media)
Packet Radio (g packet)
Photography (g pho)
Science (g science)
Technical Writers (g tec)
Telecommunications (g tele)
Usenet (g usenet)
Video (g vid)
Netweaver (g netweaver)

Conferences on The Well Itself

Deeper (g deeper)
Entry (g ent)
General (g gen)
Help (g help)
Hosts (g hosts)
System News (g news)

Exec-PC

Another interesting system started out as an overgrown BBS dedicated to downloading. While the owner of the system still thinks of it as a BBS, I think of it as a small commercial system posing as a BBS.

If you believe that one can never spend too much time on the phone or have too much software, The Exec-PC Network BBS is for you. Exec-PC went on-line in 1983. It began in the basement of Bob Mahoney's home in Shorewood, Wisconsin. He decided that there was a need for his service after spending too many long nights alone on the phone with his computer modem downloading software from electronic bulletin boards. In an attempt to get some time to socialize he decided to turn his PC into a BBS. As it often does, one thing led to another, and before he knew it he had the largest computer bulletin board in the world with the biggest MS-DOS software library ever assembled for modem callers.

Bob Mahoney is Exec-PC's owner and chief librarian. His wife, Tracey, handles the bookkeeping and administrative chores. They have no other employees. Although they've recently moved the service from their basement, maintaining the system is still a full-time job for both Mahoneys. It's strictly a "Mom and Pop" enterprise.

Over the years, Exec-PC has grown into a national archive for downloadable software. Its well-stocked library offers over seventy thousand public domain and shareware software titles. From spreadsheets to fortune telling programs, from desktop publishing utilities to program editors, practically every downloadable software title may be found there. Many shareware and public domain software authors use Exec-PC as a central distribution outlet for their wares; new versions of popular programs often appear here before they can be found on other on-line services.

Old titles are rarely deleted from the collection. It's a regular history lesson of the personal computer industry to search through the text files. There are files from bygone days that divulge rumors of a mysterious machine under development at IBM code named "Peanut" (it was eventually released as the ill-fated PCjr). Then there's the old gossip about the then-pending release of the IBM PC-XT and AT.

Exec-PC also offers the entire PC-SIG California software collection.

The History of Exec-PC

Since Exec-PC first went on-line in 1983, its main slant has been towards the business PC user. In the early days of the BBS, most systems were geared for techies or home computer users. Bob Mahoney, a manager of information systems at an appraisal company, thought it curious that no BBS existed solely for the distribution of business software. He began his system with an IBM PC, a 30 megabyte hard disk (30 megabytes was an enviably large hard disk at the time) and a 1200 bits per second modem. He began with a wide collection of downloadable software that he'd amassed from other bulletin boards. The BBS was called The Business Knowledge Exchange.

Within six months, the BBS's single phone line was chronically busy. Mahoney set about to find a way to rig the BBS to handle several modem callers simultaneously (multiuser bulletin boards were rare). After many months he discovered TurboDOS. He outfitted Exec-PC with TurboDOS and a new bulletin board software. He added two new modems and accompanying phone lines. The board could now handle an impressive three modem callers simultaneously. Mahoney thought his problems were finally licked.

Within two weeks, however, all three phone lines were constantly busy. Mahoney quickly added three more phone lines and modems. Again they were busy. Word spread fast that there was an extraordinary free software collection for downloading.

Mahoney decided that he had to renovate the system. To finance this he decided to charge a subscription fee. The callers didn't seem to mind much. The lines were still constantly busy.

He decided to make the bulletin board his career. Within three years, Bob and Tracey Mahoney had nurtured Exec-PC into a service that boasted 52 incoming phone lines and a gigabyte of hard disk storage. Bob Mahoney says, "Every time the telephone linemen would come out to the house to install more lines, they'd laugh. It wasn't your ordinary residential installation."

The original single-computer Exec-PC had been replaced by four tightly-packed power chassis holding 52 networked Z-80 boards—the equivalent of 52 PCs. Their corresponding 52 modems were stacked above on industrial steel wire-mesh shelving designed to promote air flow and prevent overheating. The whole concoction was powered by an ingenious contrivance of golf cart batteries and a power inverter. Should the Mahoneys' neighborhood suffer a blackout, the continually recharged golf cart batteries could provide Exec-PC with up to 24 hours of uninterrupted power. An Ethernet computer network link connected the bulletin board to the personal computers on Bob and Tracey's desks in another part of the basement.

Unfortunately, with each new phone line the Mahoneys added to their service, the communications software weakened. It was designed to handle a dozen, not 50+. There was no way to avoid it: it was time to upgrade, again.

The big problem was what to upgrade to. Bob Mahoney investigated. He eventually chose the computer operating system that is the pet favorite of mainframe programmers, UNIX—specifically, SCO XENIX 386. He teamed that with turbo-speed 80386-based personal computer boards.

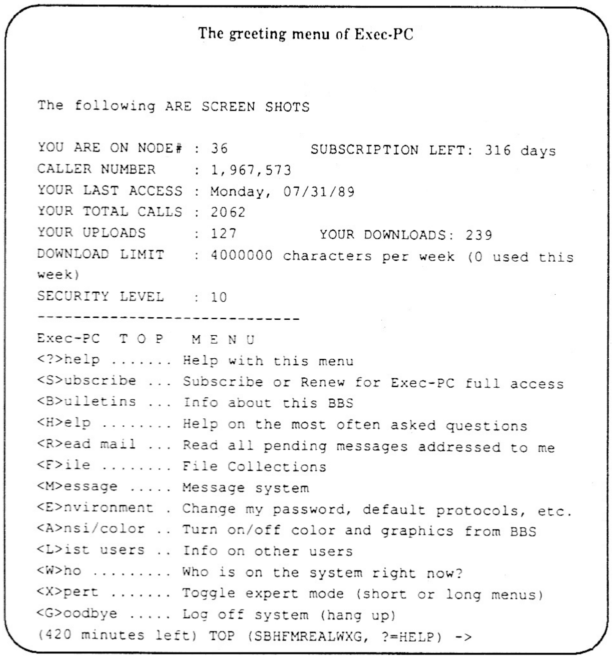
The new Exec-PC made its debut in fall of 1988. It boasted seven super-fast networked 80386 PCs serving as XENIX multiuser servers, each handling 15 callers and capable of many more. The new system was not without problems. It took more than two weeks to install the system and nearly three months to get the kinks out.

The power lines strung across the back yard were humming at a low 60-cycle frequency in response to the heavy load of power flowing into the basement. The circuit breaker box in the house soon started humming as well. Before long, the Mahoneys couldn't run the vacuum cleaner or plug in the coffee maker without popping fuses.

In addition, heat problems were mounting in the basement. The big window air conditioner near the computers was running constantly, even in the zero chill of the Wisconsin winter. (The immense heat generated by the machines cut the Mahoneys' winter heating bills by 30 percent.) To keep them cool in the summer, however, would require an air conditioner of 30,000 BTUs. If the Mahoneys wanted to continue expanding the service they would either need to install a huge new power system in the house, or move the system.

In the summer of 1989, the Mahoneys moved Exec-PC to rented office suites in a suburb outside of Milwaukee. The phone company installed six hundred phone lines in a direct link to the phone company's central office. Exec-PC now has 3.5 tons of air conditioning and its own air filtration system. Snaking through one wall is a three-inch thick telephone cable. Each of the service's server PCs, each with multiple cooling fans, sits on industrial steel shelves along the walls. Above them on wire-mesh racks sit dozens of computer modems. Its processors crunch data at a brisk 75 million instructions per second.

Figure 1.
The Greeting Menu of Exec-PC



The greeting menu of Exec-PC

```
The following ARE SCREEN SHOTS

YOU ARE ON NODE# : 36          SUBSCRIPTION LEFT: 316 days
CALLER NUMBER    : 1,967,573
YOUR LAST ACCESS : Monday, 07/31/89
YOUR TOTAL CALLS : 2062
YOUR UPLOADS     : 127          YOUR DOWNLOADS: 239
DOWNLOAD LIMIT   : 4000000 characters per week (0 used this
week)
SECURITY LEVEL   : 10
-----------------------------
Exec-PC  T O P   M E N U
<?>help ....... Help with this menu
<S>ubscribe ... Subscribe or Renew for Exec-PC full access
<B>ulletins ... Info about this BBS
<H>elp ........ Help on the most often asked questions
<R>ead mail ... Read all pending messages addressed to me
<F>ile ........ File Collections
<M>essage ..... Message system
<E>nvironment . Change my password, default protocols, etc.
<A>nsi/color .. Turn on/off color and graphics from BBS
<L>ist users .. Info on other users
<W>ho ......... Who is on the system right now?
<X>pert ....... Toggle expert mode (short or long menus)
<G>oodbye ..... Log off system (hang up)
(420 minutes left) TOP (SBHFMREALWXG, ?=HELP) ->
```

Exec-PC can service 150 modem callers simultaneously, to be increased to 300 by mid-1991. Many of its phone lines offer data transfer speeds of up to 19,200 bits per second. The rest operate at speeds up to 2400 bps.

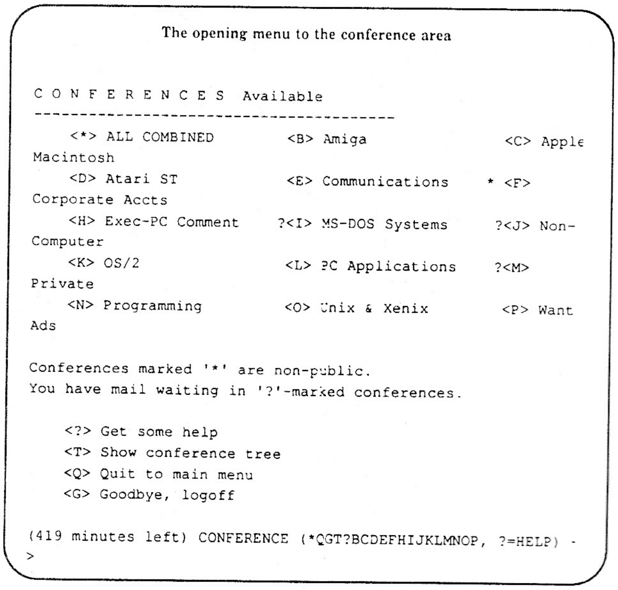
You can contact Exec-PC at the following address: Exec-PC, Inc., P.O. Box 57, Elm Grove, WI 53122, 1-414-789-4200 (voice), 1-414-789-4210 (data). Exec-PC is accessible via StarLink, PC Pursuit, and always available direct dial.

The Exec-PC Menus

When you log on to Exec-PC the menu that greets you (see Figure 1) is as straightforward as a baseball score. Simplicity is the key to Exec-PC's user-interface and one of its secrets to popularity. All menus are self-explanatory and layered in such a way that you will never get lost (see Figure 2).

For those more familiar with the system there is an expert mode that will abbreviate the menus. Commands may also be chained together

Figure 2.
The Opening Menu to the Conference Area



The opening menu to the conference area

```
C O N F E R E N C E S  Available
----------------------------------------
     <*> ALL COMBINED         <B> Amiga                <C> Apple
Macintosh
     <D> Atari ST             <E> Communications     * <F>
Corporate Accts
     <H> Exec-PC Comment     ?<I> MS-DOS Systems      ?<J> Non-
Computer
     <K> OS/2                 <L> PC Applications     ?<M>
Private
     <N> Programming          <O> Unix & Xenix         <P> Want
Ads

Conferences marked '*' are non-public.
You have mail waiting in '?'-marked conferences.

    <?> Get some help
    <T> Show conference tree
    <Q> Quit to main menu
    <G> Goodbye, logoff

(419 minutes left) CONFERENCE (*QGT?BCDEFHIJKLMNOP, ?=HELP) -
>
```

"programmer-style." For those who need it, help is always available at the touch of the question mark (?) key at any menu. There is also a complete tutorial for the service that may be downloaded at the introductory menu through use of the help function.

Cost

Software downloading is the primary function of Exec-PC. It's designed to be both fast and easy. A menu from the Mahoney Software Collection is shown in Figure 3.

For $60.00 a year, a subscriber to Exec-PC receives seven hours a week in which to download all the software they desire with few restrictions. Over 200,000 software downloads are transacted on the board each month. Subscribers call from all over the globe.

"We can tell when a country has climbed the PC evolutionary scale high enough to be able to reach out across national boundaries to dip into the shareware software pool in the U.S.," says Mahoney. "Even language differences don't seem to bother foreign callers," he says.

What's Offered

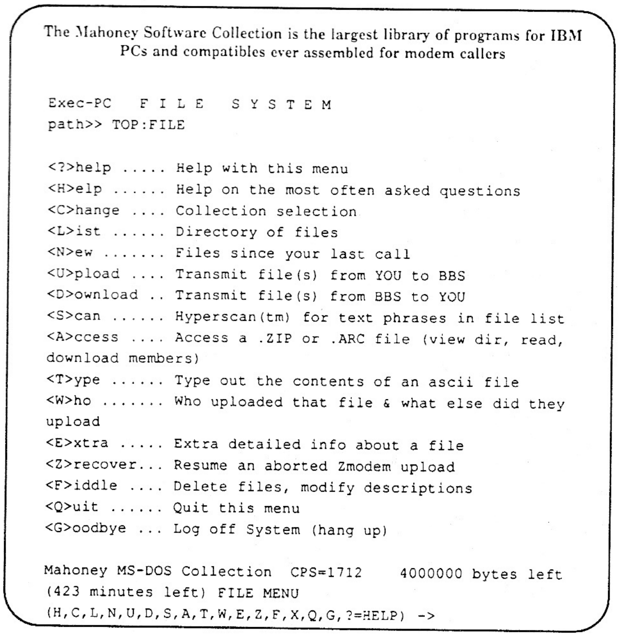
Exec-PC offers seven major software collections. The Free Collection provides telecommunications utilities and text files free to non-paying callers. Software for Apple Macintosh, Commodore Amiga, Atari ST, and UNIX/XENIX-running computers is available in file collections for each of these machines. But the service's crown jewels are the Mahoney Software Collection and the PC-SIG one, both for IBM PCs and compatibles. Over 30,000 popular shareware and public domain programs are available in the PC-SIG collection from the California software distributor of that name. Another 100,000 software titles are found in the Mahoney Collection, almost all of them uploaded by subscribers.

To encourage users to post new software on the system, Mahoney exchanges free access time for uploads. (For ten minutes of uploading a program users receive 40 extra minutes to download software.) Subscribers post over 1,000 new software titles on Exec-PC each month.

Trojan Horse and Virus Concerns

With all the media attention many subscribers are concerned about Trojan horse and destructive virus programs. (A Trojan horse is vandal software that masquerades as something benign, such as a video game or screen picture. A virus is a program with the ability to invisibly self-replicate, often spreading itself from computer to computer.) Exec-PC offers several remedies:

Figure 3.
The Mahoney Software Collection is the Largest Library of Programs for IBM PCs and Compatibles Ever Assembled for Modem Callers



The Mahoney Software Collection is the largest library of programs for IBM PCs and compatibles ever assembled for modem callers

```
Exec-PC   F I L E   S Y S T E M
path>> TOP:FILE

<?>help ..... Help with this menu
<H>elp ...... Help on the most often asked questions
<C>hange .... Collection selection
<L>ist ...... Directory of files
<N>ew ....... Files since your last call
<U>pload .... Transmit file(s) from YOU to BBS
<D>ownload .. Transmit file(s) from BBS to YOU
<S>can ...... Hyperscan(tm) for text phrases in file list
<A>ccess .... Access a .ZIP or .ARC file (view dir, read,
download members)
<T>ype ...... Type out the contents of an ascii file
<W>ho ....... Who uploaded that file & what else did they
upload
<E>xtra ..... Extra detailed info about a file
<Z>recover... Resume an aborted Zmodem upload
<F>iddle .... Delete files, modify descriptions
<Q>uit ...... Quit this menu
<G>oodbye ... Log off System (hang up)

Mahoney MS-DOS Collection  CPS=1712    4000000 bytes left
(423 minutes left) FILE MENU
(H,C,L,N,U,D,S,A,T,W,E,Z,F,X,Q,G,?=HELP) ->
```

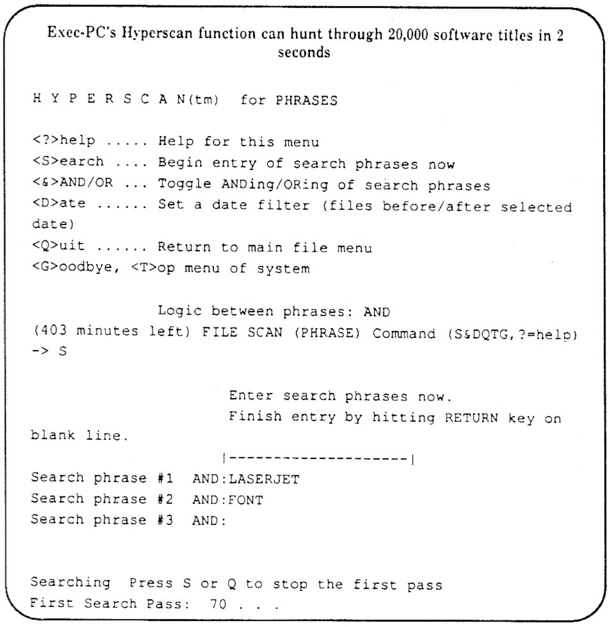
Ask Questions: Before you download a software title ask the service who posted it and when. Ask if they are still a subscriber and if so ask their security level.

Know What You're Getting: Exec-PC will also tell you what's inside a compressed file before you download it. If it's a text file, Exec-PC can type it out for you on-line.

Be Cautious: Wait for new software to "age" on the board before downloading it. This will allow time for other brave souls to try it out.

In the past, whenever a Trojan horse has appeared on Exec-PC it was only a matter of days before someone discovered it, alerted the Mahoneys, who promptly removed the software, along with its uploader, from the service. Mahoney does test any software uploads that strike him as suspicious. However, because of the great volume of software deposited on the board each day, he is unable to test everything.

Figure 4.
Exec-PC's Hyperscan Function Can Hunt through 20,000 Software Titles in 2 Seconds



Exec-PC's Hyperscan function can hunt through 20,000 software titles in 2 seconds

```
H Y P E R S C A N(tm)  for PHRASES

<?>help ..... Help for this menu
<S>earch .... Begin entry of search phrases now
<&>AND/OR ... Toggle ANDing/ORing of search phrases
<D>ate ...... Set a date filter (files before/after selected
date)
<Q>uit ...... Return to main file menu
<G>oodbye, <T>op menu of system

              Logic between phrases: AND
(403 minutes left) FILE SCAN (PHRASE) Command (S&DQTG,?=help)
-> S

                     Enter search phrases now.
                     Finish entry by hitting RETURN key on
blank line.
                     |--------------------|
Search phrase #1  AND:LASERJET
Search phrase #2  AND:FONT
Search phrase #3  AND:


Searching  Press S or Q to stop the first pass
First Search Pass:  70 . . .
```

Search and Scan for Software

Exec-PC's search and scan features make software hunting a breeze (see Figure 4). Scan through software titles and descriptions for key words and phrases, like "database" or "accounting." Exec-PC can scan 20,000 file entries in under two seconds and will list on the screen software matches within seconds after a search is begun (see Figure 5).

You may focus the hunt with AND/OR operands as well as date parameters, and even ask Exec-PC to give you a list of all the new software posted since the last time you logged on. For those who'd rather search the software library off-line, you can download Exec-PC's complete software directory and apply to it a program called Maximum Overkill (by W. Charles Taylor). This is a sophisticated search program designed specifically for hunting through Exec-PC library lists. Maximum Overkill is shareware and is available in the Free Collection on Exec-PC. Once you've located files you wish to download, query the board for an in-depth description of the software, if one has been provided. Among the board's unique flourishes is a function that will remember a list of software titles that you wish to download, then automatically transfer them to you on cue.

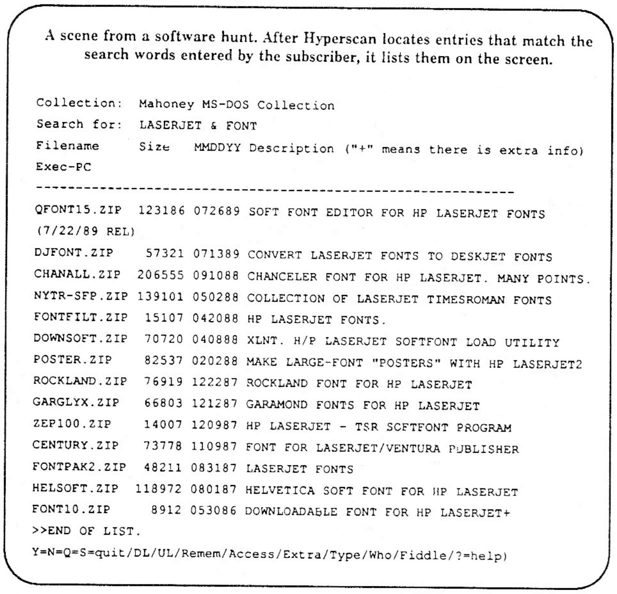
While the software library is the soul of Exec-PC, its message section is equally energetic. Public conferences range in topic from UNIX to OS/2, from spreadsheets to computer-aided design to purely recreational interaction.

Message System

Exec-PC's message system is as painless to use as a corkboard. Full-screen menus appear when you enter a public conference. Conference trees that display where you are on the service may be activated at any time. Subscribers may read through messages by date, follow conversational threads, jump to reference numbers, and mark messages for later retrieval, as well as join and exit conferences. There are other features such as message copying, and notification of receipt of messages. The public message collect may be scanned for topics. Even past conversations—years past—may be scanned.

The message system's ease of use together with its many electronic office-oriented features make it popular among corporate clientele. Numerous businesses rent private message and file areas on the service to communicate with customers and clients. A banking investment advisory firm, for instance, deposits time-sensitive information for bond investors on the service each morning, and banks from around the country call within the hour

Figure 5.
A Scene from a Software Hunt



A scene from a software hunt. After Hyperscan locates entries that match the search words entered by the subscriber, it lists them on the screen.

```
Collection:  Mahoney MS-DOS Collection
Search for:  LASERJET & FONT
Filename     Size   MMDDYY Description ("+" means there is extra info)
Exec-PC
------------------------------------------------------------
QFONT15.ZIP  123186 072689 SOFT FONT EDITOR FOR HP LASERJET FONTS
(7/22/89 REL)
DJFONT.ZIP    57321 071389 CONVERT LASERJET FONTS TO DESKJET FONTS
CHANALL.ZIP  206555 091088 CHANCELER FONT FOR HP LASERJET. MANY POINTS.
NYTR-SFP.ZIP 139101 050288 COLLECTION OF LASERJET TIMESROMAN FONTS
FONTFILT.ZIP  15107 042088 HP LASERJET FONTS.
DOWNSOFT.ZIP  70720 040888 XLNT. H/P LASERJET SOFTFONT LOAD UTILITY
POSTER.ZIP    82537 020288 MAKE LARGE-FONT "POSTERS" WITH HP LASERJET2
ROCKLAND.ZIP  76919 122287 ROCKLAND FONT FOR HP LASERJET
GARGLYX.ZIP   66803 121287 GARAMOND FONTS FOR HP LASERJET
ZEP100.ZIP    14007 120987 HP LASERJET - TSR SOFTFONT PROGRAM
CENTURY.ZIP   73778 110987 FONT FOR LASERJET/VENTURA PUBLISHER
FONTPAK2.ZIP  48211 083187 LASERJET FONTS
HELSOFT.ZIP  118972 080187 HELVETICA SOFT FONT FOR HP LASERJET
FONT10.ZIP     8912 053086 DOWNLOADABLE FONT FOR HP LASERJET+
>>END OF LIST.
Y=N=Q=S=quit/DL/UL/Remem/Access/Extra/Type/Who/Fiddle/?=help)
```

After Hyperscan locates entries that match the search words entered by the subscriber, it lists them on the screen.

to pick it up. Another firm uses Exec-PC to disseminate customer information to its satellite offices.

The BYTE Information Exchange

The BYTE Information Exchange (BIX) is an on-line conference and electronic offshoot of *BYTE* magazine. BIX's emphasis is on the personal and career growth of computer professionals. Since its founding in November 1985, it has become a gathering place for more than 30,000 hardware and software engineers, system designers, independent consultants, technology buffs, and computer industry celebrities. BIX offers a global community with users from six continents. All types of computers, programming languages, and disciplines are welcome. Nearly all proceedings are in English, although French and German are spoken along with C, LISP, and Pascal.

BIX users, many of whom call themselves "BIXen," have access to features such as private electronic mail with binary file capability, program listings uploads and downloads, a daily microcomputer industry newswire, an on-line chat facility, and more than 150 focus areas, called conferences.

BIX's Bulletin Board Exchange (BBX) allows members to call Monday through Friday to collect a file of news and features about computers and technology. This information may be republished on the member's own BBS or, in a corporate environment, E-mail system. The file includes a daily news service called Microbytes Daily along with excerpts from BIX conferences, news of new hardware and software products, product reviews, and articles from BYTE.

Another service offered by BIX is the User Group Exchange (UGX). The UGX provides private conferences for user group presidents and newsletter editors, discount subscriptions to the group's members, and access to the BBX and other materials.

Cost

BIX is a subscription-based service. An annual subscription is $156.00, which is charged in quarterly installments of $39.00. BIX is not charged by hourly usage, although *access* to BIX is charged at a rate of $2.00 an hour for off-peak use. Flat-rate TYMNET accounts are available from BIX at $15.00 a month. The BBX subscription is $196.00 per year, which includes all other public BIX areas and services.

BIX maintains direct-dial numbers capable of speeds up to 9600 baud in the Boston area. The Boston area numbers are without telecommunications charges.

BIX has two premium services: DasNet electronic mail and McGraw-Hill News. DasNet (based in Campbell, California) is also a subscription-based service. It allows BIX users to exchange private electronic mail with users of other electronic services. DasNet may be purchased separately or along with other BIX subscriptions. McGraw-Hill News is a general-purpose business newswire that generates 100 to 200 news items each business day.

BIX has made some recent changes. It has become Fido-net compatible, users may now get the BBX files as echo-mail, and there is now 9600 bps access for US Robotics HST users.

Getting Started

Registration to BIX is done on line. Users who pay the quarterly subscription fee by American Express, MasterCard, or VISA credit cards may use BIX immediately. Payment by invoiced account is also available. Two user's manuals (one on menus, the other on command interfaces) and a disk-based tutorial will be mailed within one week. (However, if you wish to use BIX before the manuals arrive, BIX has—as a default—a menuing system for new users.)

Follow these three easy steps to sign up for BIX:

1. Set your computer's telecommunications program for full duplex using either 7-bit words, even parity, and 1 stop bit, or 8-bit words, no parity, and 1 stop bit. BIX is able to receive and send at a baud rate of 300, 1200, or 2400.
2. BIX is accessible from within the United States, some of its territories and possessions, and major Canadian cities through local TYMNET numbers. To reach BIX via TYMNET contact the BIX Customer Service Line 1-800-227-2983, or, call TYMNET at 1-800-336-0149.

   Call your local TYMNET number. Depending on your baud rate, TYMNET will respond with "garble" or will request a terminal identifier. Enter the letter **A**.

   If, after you enter the letter **A**, your terminal is still receiving unreadable data—change the terminal parameters. The two choices for BIX are: 8 bits, no parity, 1 stop bit; and, 7 bits, even parity, 1 stop bit. You may need to switch from one set of parameters to the other.

   TYMNET will ask you to log in. Type **BIX**, then hit the ENTER key. You will then be connected to the BIX computer.
3. The BIX logo should now scroll onto the screen and a prompt will ask you to enter your name. Respond with the word **NEW** (for new user). If you wish to use the service immediately BIX has a built-in default for new users so that they are directed through the necessary commands with a menu.

To reach BIX from outside the U.S., you need a packet network account with your local Postal Telephone and Telegraph (PTT) company. From your PTT, enter 310690157800. Then follow instructions starting at Step 3. A list of PTT addresses and contacts for most countries is available by calling or writing BIX.

BIX has a direct-dial number in suburban Boston. The number is 1-617-861-9767. Type in **BIX** at the prompt. Then follow the instructions beginning with Step 3.

If you follow these instructions but still are unable to log on to BIX or require further information, callers from the United States and Canada can telephone the BIX Customer Service Line at 1-800-227-2983. Help is available from 8:30 a.m. to 11:00 p.m. EST Monday through Friday. For those in New Hampshire or outside the continental United States call 1-603-924-7681.

The mailing address for BIX is: One Phoenix Mill Lane, Peterborough, NH 03458.

New Users

New users are defaulted into a menu mode. This is an aid to new users until the user's manuals arrive.

BIX maintains help files that are available at every system prompt (except the ".More.." prompt). On-line help is also available privately through BIXmail to "helper."

CTRL-C is your abort key. Please use it only in emergencies, such as to break a long message or an inappropriate search. CTRL-C may take a second or two to take effect. This is due to delays inherent to packet-switching networks. The BREAK key supplied with your modem software should work more efficiently than CTRL-C. BIX recommends that you use the modem software's BREAK key, or disconnect sequence.

The Main Menu

BIX has three primary areas: electronic mail, conferences, and listings. After you sign on to BIX, the BIX main menu is displayed.

Select OPTION 1 and press ENTER to go into the BIX Mail Subsystem. In Mail, you can send and receive private memos, learn the status of your mail in- and out-baskets, and privately send and receive binary files, such as Excel worksheets.

OPTION 2 puts you into the BIX conference subsystem. Here you can see lists of conferences, join and resign from conferences, read and post public messages, and search the BIX Index for specific words, phrases, or topics.

Listings, OPTION 3, gives you access to the BIX program upload/download area. BIX Listings has all the files that complement *BYTE* magazine articles, beginning with the September 1984 issue, and dozens of areas of public-domain and shareware programs. BIX has listings areas for computer languages, stackware, and for machines ranging from the Apple to the Zenith and for Sun to DEC. BIX routinely screens all files for computer viruses.

OPTION 4, CBix, the BIX Citizen Band Simulator, is where you may converse with other users in real-time. (No part of your conversation is recorded.) When you first enter **CBix**, information on your terminal type and backspace character is requested. Once successfully logged into CBix, commands are preceded with the slash character. To send a message, type it, press the ENTER key, and the message will be sent. Type in a slash then the word **quit (/quit)** to leave CBix.

Convenient access to the MicroBytes Daily News service is provided by OPTION 5.

OPTION 6 is access to McGraw-Hill News for articles on general business topics.

The Subscriber Information menu, OPTION 7, allows you to see who is on line, to search the BIX user list, and check billing information.

The BIX Individual Options menu, OPTION 8, allows you to tailor your BIX environment to your personal preferences. You can change the screen length and width, make up a new password, and edit your on-line resume. You may also select upload and download protocols. Changes to your BIX operating environment may be permanent or one-time only.

The Quick Download menu, OPTION 9, saves time with a quick and easy way to download your conference and mail messages. These materials may then be viewed off-line, at your convenience. BIX supports ASCII, Kermit, Xmodem, Ymodem, and Zmodem protocols.

Use OPTION 10 to abandon menus and try out the BIX command interface. The command interface uses words or phrases. Type a ? at any prompt to get help. Turn the menus back on by typing the phrase **OPT MENU ON QUIT**.

OPTION 11 ends a BIX session.

BIX Electronic Mail Menu

When first connected to the BIX mail subsystem, there will be a listing of any unread messages. Items 3 and 4 allow you to see the status of both sent and received mail. Item 5, Delete Mail, is to clear the mail in- and out-baskets.

ITEM 1 is to read any incoming messages in chronological order. You may also specify a selected message by number.

Use ITEM 2 to send mail to another BIX user. BIX will prompt you for the name of the person that you want to send the message to. You may specify up to a dozen names at one time. BIX will ask for a subject name. You will then be in the workspace to type your message—this area is called the "scratchpad" by this system. While in the scratchpad keep your lines to 60 to 65 characters and use a return carriage at the end of each line. (Use the ENTER key.) You cannot edit the message in this mode, except for use of the BACKSPACE key on the line which you are on. Once the message is written, exit the write mode, then you may edit. After editing the message, press ENTER to activate the Mail Send Action menu. Use ITEM 1 to deliver the message.

ITEMS 2 and 3 of the Mail Send Action menu allow you to send copies of the message to as many as twelve additional BIX users. If there are more than twelve people to whom you wish to send the message, reenter the command and specify another twelve users.

To change the subject of your message, select ITEM 4 on the Mail Send Action menu. BIX will prompt you for a new subject name and redisplay the Mail Send Action menu.

ITEMS 5 through 7 allow you to discard, review, or edit your memo. The BIX editor is not a complicated application. For lengthy or complex messages, write the document off line then upload it to BIX.

Use ITEM 8 to attach a binary file, such as a Lotus spreadsheet, to your message. The size limit is 2 megabytes. Only one file can be attached at a time. Multiple files must be uploaded and mailed individually.

ITEMS 9 and 10 are an aid if you've forgotten someone's city, state, or last name.

Enter QUIT from this menu to return to the BIX main menu without mailing or discarding your message. The commands P and MM clear your scratchpad. The former returns you to the Electronic Mail menu, and the latter returns you to the BIX main menu.

The Mail Read Action menu appears after you've read an incoming mail message. Your options here are to reread the message, reply or delete it, forward the message to another user, or let it remain in your in basket. If your message is part of a long, ongoing correspondence, use selection number 6 to read a previous memo to refresh your memory.

BIX Conferences

A conference is a structured discussion made up of topics and messages. Like a single book in an encyclopedia, a topic is a single element of the conference. A topic contains messages on the theme of both the conference and the topic itself. The messages are text files readable by all members of that conference. A BIX conference message can range in size from one character to 80,000 characters.

A line of equal signs (= =) divides one message from another, indicates the start of a new message, and marks the beginning of the header that BIX applies to each message.

A line of dashes (--) is the end of the header, and tells you that the message is about to begin.

The first line of text in the header (after the equal signs) contains the following information:

1. conference/topic name
2. message number
3. author of the message
4. number of characters
5. date and time posted

The second and third lines of the header are additional status reports, and may not always be present. In this example, the second and third lines are telling you (a) that this message is a comment on message 111, and (b) that other users have commented on this message.

Message threading is the term that describes the relationship of the original message with comments to it. A series of linked messages is a *thread.*

Each BIX conference has one or more topics. To join a conference automatically makes you a participant in all its topics. You can leave a conference any time you choose, move from topic to topic, or resign from a particular conference or topic. Every BIX conference has a moderator whose job is to answer questions and help newcomers. By selecting ITEM 2 at the BIX main menu you enter the BIX conference subsystem, and the Conference Subsystem menu is displayed. (ITEMS 2, 3, and 4 of this menu are better left for when you are more familiar with BIX.)

In the Conference Subsystem menu use ITEM 1 to browse through a list of BIX groups and exchanges. BIX divides conferences into such groups as computers, graphics, and programming languages. Exchanges include Amiga, IBM PC, Macintosh, and Writers. When prompted, enter the number of the group or exchange to display a list of conferences in that group.

All BIX conferences belong to a group or to an exchange. Exchanges differ from groups in that they offer a range of conferences on a particular theme, such as the Amiga computer, and have a full-time editor coordinating activities.

Both groups and exchanges are categories. You can browse through a group as you would the sections of a library, to see what's available under a particular category, but you do not enroll in that category.

To Get into a Conference

To enroll in a conference, move into the Conference Subsystem menu (as described above), use ITEM 1 to look through the list of groups and exchanges, then enter the corresponding number of the conference that you wish to join.

When you first join a conference, BIX will display a welcome message, a list of topics in the conference, and the TOPIC? prompt. You can respond to the prompt by typing in the name of a topic or you may enter a carriage return. In response to the latter, BIX will go to the first topic in the conference.

Once in a topic, use the ENTER key to begin. At the end of each message a prompt will be displayed:

Return for next, m for menu, or message number:

As you read messages, BIX employs a pointer that marks messages that you read. This ensures that only new messages are displayed when you next join that conference. It is possible to reset this pointer, and BIX lets you read forward, backward, or only those messages posted after a specific date. At the end of a message, you may enter the command **REFERENCE** to read the message in conversational order rather than in chronological order. (This is called a message thread.)

To attach your thoughts to someone's statement, and thereby add to the thread, use the command **COMMENT**. Enter the command **SAY** to add an original message to the conversation.

A variety of commands are available within a conference. Enter **HELP** to see the commands. Enter the letter **M** to see your menu options. A double M (**MM**) will return you to the BIX main menu.

BIX Keyword Index

The BIX Keyword Indexer finds a discussion you're interested in. It scans all open BIX conferences for a keyword or phrase and reports back to you if it's found. You may then view or download its findings.

When you join the Keyword Indexer, BIX displays this prompt:

```
BIX Index    Word or phrase to look for (or 'quit'):
```

Type in the word or phrase that best describes what you are looking for. Be as specific as possible in your requests: words such as "Amiga," "computer," or "IBM" are much too general. Instead, use words or phrases such as "CLI," "model 100," and "BIOS."

The FILE command tells the Indexer to put its search results into your scratchpad. From there, you can download them once you leave the Indexer. The BIX Keyword Indexer will let you search and file any number of keywords.

To download the entries, first exit the Indexer by entering **QUIT** at the Indexer search prompt. This returns the Conference Subsystem menu. Enter **MM** to go back to the BIX main menu.

In the main menu, select ITEM 9 (quick download), which will produce the Quick Download menu. From this menu, choose option ITEM 3 (Download your SCRATCHPAD). Then it's off to the Download Scratchpad menu. Set your telecommunications software to capture ASCII screens. Then, choose ITEM 1 (ASCII transfer). All the entries will scroll by. When complete, save the captured data and enter **MM** to leave the Quick Download Subsystem. BIX will clear your scratchpad automatically.

If you prefer to use a protocol to download the messages, select ITEM 2 (protocol transfer) from the Download Scratchpad menu. The default setting is Xmodem. To use Kermit, Ymodem, or Zmodem, it must be set beforehand by the use of ITEM 5 in the Individual Options menu.

The BIX Listings Subsystem

The BIX Listings subsystem consists of a general area and conference-specific areas. You can download files from or upload files to most areas. Enter the BIX Listings Subsystem by selecting ITEM 3 from the BIX main menu or the topic "listings" in a conference.

In the main Listings area, you'll find the source code associated with most of the articles that have appeared in *BYTE*, beginning with the September 1984 issue, and a wide assortment of public-domain and shareware files. It has separate divisions covering specific brands of computers, language types, operating systems, and disciplines. Listings areas are broken down into such sub-areas as applications, leisure, and utility.

BIX Listings has three operating modes: Menu, Verbose prompts, and Terse prompts. The default setting is the Menu mode, and all the modes use the same commands. BIX Listings are flexible. BIX lets you choose the length of file descriptions, preset download and upload protocols, and set the area to enter when you join Listings. Enter your commands at the Selection: prompt. You may use the number, the word in uppercase letters, or the first three letters of a command. Enter the command **LIST ALL** to produce a list of all the files in the file area.

PC MagNet

PC MagNet is an on-line information service to provide *PC Magazine's* readers instant access to *PC Magazine's* programs, articles, databases, and editorial staff. It also gives *PC Magazine* editors and readers discussion forums where they can share their opinions, experiences, and expertise. PC MagNet users can also get expert advice on how to configure and use the programs provided in *PC Magazine*, and the forums are the source for cutting edge information on new hardware and software, especially OS/2.

PC Magazine's first on-line service, the Interactive Reader Service, was established in 1985. It was based on one PC-AT and had two incoming lines. Over the next few years that system was expanded to 8 ATs, 44 modems, and systems on both coasts. It used DMA's CHAIRMAN BBS software,

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Datapro Research Group. Delran NJ 08075 USA

and Arnet's multiport serial adapter to access 6 comm ports per AT. *PC Magazine's* IRS was flooded with callers who wanted to download their utilities, and in 1988 they moved the IRS to a fully interactive system on PC MagNet. Now *PC Magazine* is capable of more than 400 simultaneous callers.

PC MagNet offers a variety of features, including fast and easy access to utilities, benchmark programs, forums, and libraries and databases.

Utilities to Download

PC Magazine utilities in one place—hundreds of programs are available in the PC MagNet Utilities Database. These free programs have been published in the pages of *PC Magazine* and are designed to help you get more out of your computer. Some of the more popular utilities are CO.COM, which will help you move and copy files, TED.COM, which is one of the tiniest editors you'll ever see, and the *PC Magazine* Reviews Index—a downloadable index to past articles.

Benchmark Programs

PC Labs Benchmark Series of Tests—the same tests used to analyze computer hardware and software—are available to you.

Forums

One of the most popular aspects of PC MagNet are its forums.

Editorial Forum: Here you can talk with *PC Magazine* editors about the latest offerings in the magazine. Discuss the fast-breaking trends in the computer industry with *PC Magazine* columnists such as Will Zachmann, Stephen Manes, and yours truly, John C. Dvorak.

Tips/Utilforum: This is the place to go for expert advice on how to use your hardware and software. You can ask *PC Magazine* veterans about your configuration, and get answers almost immediately. And the forum libraries are filled with *PC Magazine* programs and the latest shareware programs.

Programming Forum: In this forum you can get the latest news on OS/2 from Charles Petzold, power programming tips from Ray Duncan, and questions answered from on-line experts.

After Hours Forum: This popular forum is where users talk about topics that don't necessarily have to do with computers. Discussions about beer seem prevalent.

Practice Forum: Here's where you can learn the on-line structure without being charged $12.50 an hour. While in the Practice Forum no charges are accrued except your network (TYMNET, Telenet, or CompuServe, whichever you dialed in on) access charges. The normal $12.50/hour charges are suspended.

Libraries and Databases

Also note there are more than 30 Forum Libraries, for the exchange of files and utilities uploaded by *PC Magazine*, and PC MagNet users.

The Computer Library family of on-line databases is designed to provide a complete reference resource for you. It includes Computer Database Plus and Computer Directory.

Computer Database Plus is a comprehensive collection of computer-related article summaries and full text from leading publications in the computer industry. Computer Database Plus provides comprehensive coverage of major computer industry publications in the areas of hardware, software, electronics, engineering, communications, and the application of technology.

Over 130 magazine, newspaper, and journal titles are covered in Computer Database Plus. Coverage includes *PC Magazine*, *Byte*, and *MacUser* as well as trade and professional titles such as *Communications of the ACM* and *PC Week*. Coverage for most titles begins as of January 1, 1987, and is updated weekly. Every article contains either a summary or full text; most have both. Computer Database Plus contains both a connect surcharge and an article/summary surcharge.

The Computer Directory is an on-line reference for information on computer products and their manufacturers. This new service helps you find virtually any hardware, software, or telecommunications product sold in North America. More than 55,000 products are listed, along with profiles of more than 9,000 companies that manufacture those products.

Searching the Computer Directory is easy, using criteria such as product name, company name, product type, and price range. It uses the same powerful search tools as its companion product in Computer Library, Computer Database Plus, so it's also possible to search on any words contained in product or company listings.

Computer Directory carries surcharges above standard PC MagNet rates.

PC MagNet is administered by CompuServe Information Service, which means PC MagNet is located on CompuServe's computers. CompuServe handles the customer support and administrative support for PC MagNet. When you receive your bill it will probably list the billing source as CompuServe/Ziff (Ziff-Davis publishes *PC Magazine*). It costs $12.50 per hour (not including network charges) for 1200 and 2400 bps service.

If you have questions about PC MagNet, you can ask Customer Service. Customer Service makes it easy to get the help you need, whether it is on line, or by calling.

If you send an electronic message to Customer Service, a representative will respond via EasyPlex as quickly as possible. You are not billed for your connect time while using the Feedback area.

If you would rather call Customer Service, representatives are available from 8:00 a.m. to midnight Monday through Friday, and from 2:00 p.m. to midnight on weekends (EST). Holiday hours will vary. To reach Customer Service dial 1-800-848-8990 within the contiguous United States, except Ohio. Dial 1-614-457-8650 from within Ohio or from outside the contiguous United States.

How to Get to CompuServe from PC MagNet

To access the CompuServe Information Service from PC MagNet, select "CompuServe Information Service" from the PC MagNet top menu or type **GO CIS** at any ! prompt. If you know the name of a specific CompuServe service, you may also type **GO CIS:XXXX** where XXXX represents the CompuServe "Quick Reference Word."

To return to PC MagNet from CompuServe, type **GO PCMAGNET** at any ! prompt. You may also go directly to a PC MagNet service from CompuServe by typing **GO PCM:XXXX** where XXXX represents the PC MagNet service name. For example, **GO PCM:EDITORIAL** would take you directly to the Editorial Forum.

Getting Started

You can sign up on line for no additional charge. To join PC MagNet, set your communications software to 1200 bps, 7 data bits, even parity, 1 stop bit, and full duplex.

You can access PC MagNet through Telenet, TYMNET, or any of the CompuServe access phone numbers (there are more than 300). These are a few of the CompuServe numbers for 1200 bps access. The network charge is 30 cents per hour, and this is in addition to the $12.50 per hour that PC MagNet costs. Other networks tend to charge more.

Atlanta	1-404-266-7014
Boston	1-617-542-1796
Chicago	1-312-693-0330
Dallas	1-214-953-0212
Houston	1-713-462-0202
Los Angeles	1-213-739-8906
Miami	1-305-266-0231
Minneapolis	1-612-342-2207
New York	1-212-422-8820
Newark	1-201-643-0404
Philadelphia	1-215-977-9758
Pittsburgh	1-412-391-7732
San Diego	1-619-569-8360
San Francisco	1-415-296-0375
Seattle	1-206-241-9111
St. Louis	1-314-241-3102
Washington	1-202-388-4280

When you get a prompt the procedure is the same as for CompuServe.

1. Hit CTRL-C or ENTER and you'll either get a HOST NAME prompt or a USER ID prompt.
2. At the HOST NAME prompt, enter **CIS.**
3. At the USER ID prompt, enter **177000,5000.**
4. At the PASSWORD prompt, enter **PC*MAGNET.**
5. At the ENTER AGREEMENT NUMBER prompt, enter **Z10D8900.**
6. Register your name and enter your MasterCard, Visa, or American Express card number. For information about direct corporate billing, call 1-800-848-8199.

7. Your personal User ID and Password will be displayed at the end of the registration process. Please record them and have copies in a secure place.
8. A new password will arrive in the mail within ten days to confirm your subscription.

At the end of the registration process you will go directly into PC MagNet and see the main menu:

PC MagNet PCM-1

1. What's New on PC MagNet
2. PC MagNet Assistance
3. Search for PC Magazine Utilities and Programs
4. Forums—talk to PC Magazine
5. EasyPlex (Electronic Mail)
6. Free—Participate in a PC Magazine Survey
7. Computer Library (Full-Text Search)
8. CompuServe Information Service

Welcome to PC MagNet! ■

AgriData Resources, Inc.

COMPANY INFORMATION

AgriData Resources, Inc.
330 E. Kilbourn Avenue
Milwaukee, Wisconsin 53202 (414) 278-7676

UPDATE: *Following a conversion to IBM mainframe computers in 1988, AgriData has changed its search software and basic prompt structure. Users now work through various levels to search, update, and view information. Also, as a result of one of its major competitors (AGNET) going out of business, AgriData further solidified its number one position in the on-line agricultural information business.*

Company Background

AgriData Resources, Inc. (ARI) specializes in business and communications services for the North American agriculture industry. Founded in 1981, ARI's on-line information service, AgriData Network, features agriculture-related news; market prices; market advisories; weather; and government, university, and association reporting in the AgriScan service. Other network services include the StarGram electronic mail service, the Ag Ed Network education service, the AgriGuide service, AgStats, Used Equipment Service, and the Product Information Center.

ARI's customers include agribusiness companies (manufacturers, distributors, dealers), farmers/producers, farm managers, county extension agents, bankers, economists, college faculty, high school agriculture teachers, and USDA and congressional officials.

AgriData's AgriData Network is an on-line, dial-up, interactive information and communications service. The Network is tailored to the needs of the agribusiness community and offers news, advisory services, cash and futures prices, educational courses, and electronic mail capabilities.

AgriData Resources, Inc., founded in 1981, provides business and communications services for the North American agriculture industry. Its on-line service, the AgriData Network, offers weather; news; markets and market advisories; and government, university, and association reporting. Other offerings include the *StarGram* electronic mail service and the *Ag Ed Network*, an on-line educational network featuring more than 900 agriculture "lessons," plus news and software reviews.

AgriData's customers include farmers/producers, farm managers, county extension agents, bankers, economists, business executives, equipment dealers, chemical suppliers, seed dealers, college faculty, high school agriculture teachers, and USDA and congressional officials. The company is privately owned.

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A summary of the company's services follows:

- Field Management Systems, designed to support intracompany network services to link field sales personnel and computer-to-computer communications among remote locations; and interindustry network services, including links to suppliers, distributors, warehouses, customers, and external sources of business information.
- Private Network Applications, designed to facilitate interorganizational and intraorganizational connectivity. Included are Electronic Data Interchange (EDI) services, which provide for the computer-to-computer exchange of formatted business documents such as purchase orders and inventory.
- Electronic Mail, designed to eliminate costly "telephone tag" sessions that bog down business activities. ARI's electronic mail service enables users to communicate electronically with each other.
- Information Services, which include access to business and education information found in the AgriData Network.

Competitive Position

In the last decade, many forces have impacted agriculture—the nation's largest industry. These forces include rapid gains in worldwide agricultural production capacity, foreign and domestic farm and trade policies, and an information explosion resulting from advances in computer technology and farm equipment. All have worked to change agriculture.

To remain competitive in the face of these increasing pressures, many agriculture businesses, farmers/ranchers, and agriculture educators are turning to on-line services. AgriData Resources, through its AgriData Network, is the leading company serving this market. Smaller competitors include Acres and Pioneer. Another competitor, AGNET, went out of business during the past year.

In addition to AgriData Network, an electronic information service for the agriculture market that offers information retrieval, communications, and education; ARI offers company-wide data communications and network products and services.

RESOURCES AND FACILITIES

Customer Support/Sales and Marketing Services

AgriData Network subscribers receive the following user support materials:

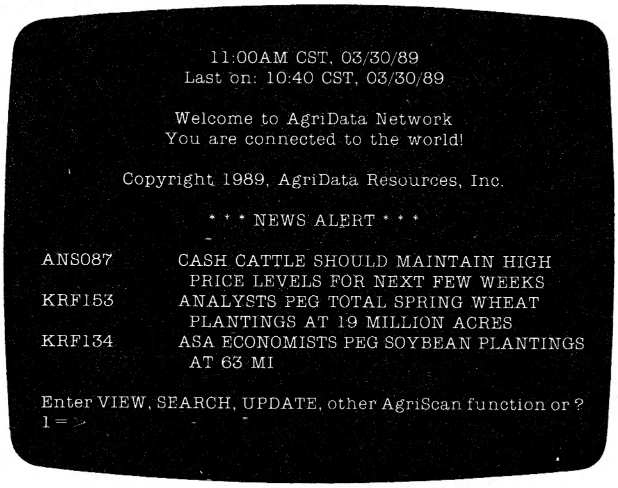
- An AgriData Network Member Guide.
- Annual indexes for the AgriScan business information service, the Ag Ed Network service and the AgriGuide service, which enable users to locate reports, report overviews, and access codes by subject.
- A free subscription to the company's monthly magazine, *FarmFutures*.
- ARI's monthly newsletter, *AgriData Network Review User Support Sheet*, which provides answers to questions, updates on available services, and applications advice.
- A quarterly ARI promotional newsletter.
- A 24-hour client service support number.

All marketing is managed out of AgriData Resources, Inc., headquartered in Milwaukee, Wisconsin.

NETWORKING SERVICES

Users can access the AgriData Network through Telenet (in Canada, Datapac), WATS, IBM Information Network (IN), and direct dial.

The network is compatible with personal computers, communicating word processors, and data terminals equipped to communicate over standard telephone lines. AgriData Network customers have a choice of 300, 1200, or 2400 baud access.



```
                    11:00AM CST, 03/30/89
                  Last on: 10:40 CST, 03/30/89

                  Welcome to AgriData Network
                 You are connected to the world!

            Copyright 1989, AgriData Resources, Inc.

                     * * * NEWS ALERT * * *

ANS087        CASH CATTLE SHOULD MAINTAIN HIGH
               PRICE LEVELS FOR NEXT FEW WEEKS
KRF153        ANALYSTS PEG TOTAL SPRING WHEAT
               PLANTINGS AT 19 MILLION ACRES
KRF134        ASA ECONOMISTS PEG SOYBEAN PLANTINGS
               AT 63 MI

Enter VIEW, SEARCH, UPDATE, other AgriScan function or ?
1 = >
```

Figure 1. The welcome screen that greets users of the AgriData Network.

ON-LINE DATABASES

AgriData offers the following databases and on-line services through its AgriData Network:

AgriScan—a continuous business information service, business advisor, and farm business management tool with "portfolio manager" functions. AgriScan provides business, financial, marketing, price, weather, livestock, and crop information. It also includes analysis and recommendations from market analysts, economists, meteorologists, and researchers throughout the U.S. and 48 other countries. Table 1 lists the sources providing information for this service.

Ag Ed Network—an on-line service that provides hundreds of educational courses and lessons for producers and agricultural-vocational classrooms. Ag Ed features "live" lessons with up-to-date information designed to teach business, management, and marketing skills. The network was created in concert with university faculty and community college teachers, high school agriculture teachers, and the National FFA organization (formerly the Future Farmers of America).

Ag Stats—an agriculture statistics service containing conservation tillage data from the U.S. Bureau of Census, Conservation Tillage Information Center.

AgriGuide—a production technology database, produced by Doane Publishing, featuring dairy and swine reports from the *AgTECH* database.

Newsfinder—operating as a closed database and communications network within the AgriData Network, Newsfinder offers electronically delivered, subject-selectable news stories from the Associated Press (AP) to nondaily newspaper publishers in the U.S. The service is operated by AgriData for the AP; all Newsfinder subscribers become members of the AP.

AgriData Resources, Inc.

NEWS

General, Business, and Financial News; Ag Business; Markets and Commodity

AgriData News Service
American Soybean Association
Associated Press (The)
Auburn University
Des Moines Register
FarmFutures
Foreign Agricultural Service
Knight Ridder Financial News
National Milk Producer's Federation (NMPF)
Office of Government & Public Affairs
Unicom News Service
U.N.-ITC Market News Service
U.S. Department of Agriculture

State Agricultural News

Kansas State University
Ohio State University
Oklahoma State University
Purdue University
Texas A&M
University of Georgia
University of Illinois
University of Wyoming
U.S. Bureau of the Census

FUTURES

Futures Price Quotes and Trading Data

Chicago Board of Trade (CBT)
Chicago Mercantile Exchange (CME)
Chicago Rice & Cotton Exchange (CRCE)
Coffee, Sugar & Cocoa Exchange (CSCE)
Commodity Exchange Inc. (COMEX)
Futures, Options Exchange (FOX)
Hong Kong Futures
Index & Options Market (IOM)
International Monetary Market (IMM)
Kansas City Board of Trade (KCBT)
London International Financial Futures Exchange (LIFFE)
London Metals Exchange (LME)
MidAmerican Commodity Exchange (MCE)
Minneapolis Grain Exchange (MPLS)
New York Cotton Exchange (CTN)
New York Futures Exchange (NYFE)
New York Mercantile Exchange (NYM)
Paris Futures
Sao Paolo Futures
Singapore Futures
Sydney Futures
Tokyo Futures
Winnipeg Grain Exchange (WPG)

ADVISORIES

Market Analysis and Advisory Services

Brock Reports
Doane's Agricultural Report
FarmFutures Market Outlooks
Helming Market Outlook and Advisory
Kansas State University
Knight Ridder Financial News
News-A-Tron
Ohio State University
Oklahoma State University
Purdue University
South Dakota State University
Texas A&M
Top Farmers of America Advisory Service
University of Illinois
USDA—Agricultural Marketing Service

GOVERNMENT REPORTS

U.S. Government Agricultural Reporting

Agricultural Marketing Service
Economic Research Service
Foreign Agricultural Service
National Council of Farmers Cooperatives
U.S. Bureau of the Census
U.S. Department of Agriculture
U.S. Department of Commerce
U.S. Treasury
USDA Information Service

AG BUSINESS

World Agribusiness News

Agricultural Marketing Service
AgriData News Service
Associated Press (The)
Des Moines Register
FarmFutures
Knight Ridder Financial
Office of Government and Public Affairs (OGPA)
USDA Press Service

Management and Market Research

Conservation Tillage Information Center
I&T Technical Publications
U.S. Bureau of the Census
U.S. Department of Commerce
U.S. Treasury

CHEMICALS

Agricultural Chemical Information

AgriData Product Information Center
National Farm Medicine Center

AG WEATHER

Agricultural Weather Management, Forecasts, Crop Models, and Current Weather

Associated Press (The)
Global Weather Services

FARM HEALTH

National Farm Medicine Center

EDUCATION

AgriData Resources, Inc.
California Ag Ed Network
  California Polytechnic State University, San Luis Obispo
  University of California-Davis
Center for Futures Education, Inc.
Colorado State University
Doane Publishing, Software Reviews
Future Farmers of America (FFA)

Table 1. Sources for the information provided by the AgriData Network.

EDUCATION (Continued)

Montana State University
Purdue University
Top Farmers of America

DAIRY

Dairy Information Services

Knight-Ridder Financial News
National Milk Producer's Federation (NMPF)
USDA—Agricultural Marketing Service

LIVESTOCK AUCTIONS

Livestock Auctions and Sales Reports

Knight-Ridder Financial News
USDA—Agricultural Marketing Service
Wisconsin State Department of Agriculture, Trade & Consumer Protection

Table 1. Sources for the information provided by the AgriData Network (Continued).

Product Information Center—an electronic product reference catalog that provides computer access to current information and technical specifications on chemicals, herbicides, pesticides, and other agriculture-related items for sale. Leading agriculture businesses furnish the information.

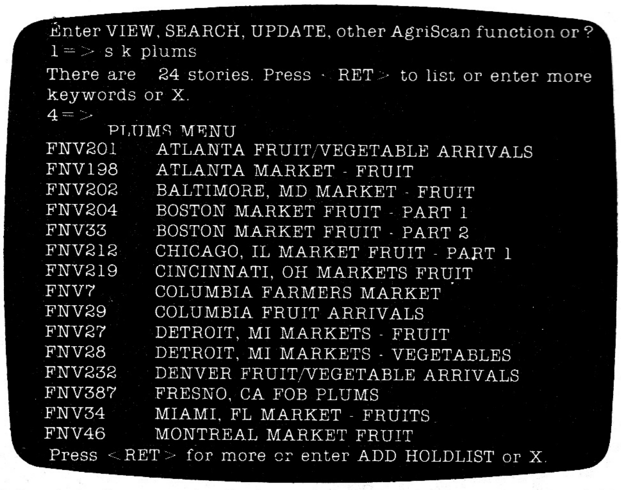
Pricing

The AgriData Network membership fee is $180 to $399 per year depending on the specific service requested. Hourly connect-time rates are $28.19 for 300 baud access, $39.24 for 1200 baud access, and $48.00 for 2400 baud access. Connect time is billed in one-minute increments. Report access fees vary by report type, but range from $0.06 to $4.71. In addition to connect time rates for E-Mail users, subscribers pay on-line storage fees of $0.24 per 2400 characters.

OTHER SERVICES

AgriScan

For users interested in only the AgriScan business information service, an unbundled package is available. After paying a $100 start-up fee, there is a monthly $20 charge, plus usage. Subscribers have the capability to enter any of the other AgriData Network services (Ag Ed Network, StarGram, etc.) for a $5 gate fee each time they move into a service other than AgriScan.



```
Enter VIEW, SEARCH, UPDATE, other AgriScan function or ?
1=> s k plums
There are  24 stories. Press <RET> to list or enter more
keywords or X.
4=>
      PLUMS MENU
FNV201     ATLANTA FRUIT/VEGETABLE ARRIVALS
FNV198     ATLANTA MARKET - FRUIT
FNV202     BALTIMORE, MD MARKET - FRUIT
FNV204     BOSTON MARKET FRUIT - PART 1
FNV33      BOSTON MARKET FRUIT - PART 2
FNV212     CHICAGO, IL MARKET FRUIT - PART 1
FNV219     CINCINNATI, OH MARKETS FRUIT
FNV7       COLUMBIA FARMERS MARKET
FNV29      COLUMBIA FRUIT ARRIVALS
FNV27      DETROIT, MI MARKETS - FRUIT
FNV28      DETROIT, MI MARKETS - VEGETABLES
FNV232     DENVER FRUIT/VEGETABLE ARRIVALS
FNV387     FRESNO, CA FOB PLUMS
FNV34      MIAMI, FL MARKET - FRUITS
FNV46      MONTREAL MARKET FRUIT
 Press <RET> for more or enter ADD HOLDLIST or X.
```

Figure 2. Our search of AgriData's AgriScan business information service under "plums" retrieved the report titles shown above.

AgriDaily

An electronic business and market update for agriculture. Updated weekdays at 6 p.m., this electronic newsletter includes information on the day's major agricultural commodity markets, general agriculture news, and outlook and strategy briefs for either grains or livestock producers. Subscribers pay a $100 start-up fee and then either $100 for a four-month subscription to the grains edition or the livestock edition, or $160 for a combined version.

Printed Publications

In addition to its online services, ARI publishes the following periodicals:

FarmFutures magazine—a monthly business, finance, and marketing publication serving more than 200,000 "Class 1A" farmers and ranchers whose annual gross sales exceed $100,000.

Agriculture—a business and news weekly that reports on state, national, and international events in farm business, agribusiness, and government from major worldwide news-gathering agencies.

For more information about any of these products and services call AgriData Resources, Inc., at (800) 558-9044.

Electronic Mail

AgriData's electronic mail service, *StarGram*, permits users to communicate with each other instantly. Delivery options available include first-class, four-hour, overnight, volume mail, and telex. Through AgriData's MCI Mail for Agriculture service, users can send electronic paper messages to anyone in the free world. In addition, AgriData network and MCI users may send electronic mail messages to each other. ☐

ALANET

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Synopsis

Editor's Note

ALANET, the American Library Association's Electronic Information Service, serves mostly librarians—public; academic; and, to some extent, corporate. ALANET offers electronic communications, information services, networking support services, and database services. ALANET's electronic newsletters and other information services have a library science focus, and face little competition.

ALANET's databases include *BNA Online*—a collection of five electronic newsletters providing notification of legal, legislative, and regulatory developments in the areas of business, finance, taxation, labor, law, securities, environment, and tax; *DIALCOM Electronic News*—a compilation of several newswire services; and *The Official Airlines Guide (OAGEE)*—which contains all of the commercial airline flight schedules worldwide. The On-Line Databases section of this report covers these databases in detail.

Report Highlights

Launched in 1984, ALANET features electronic communications, including electronic mail; information services, including electronic newsletters; on-line databases; and, through gateway arrangements, access to on-line vendors. Even though ALANET's user base is still small, growth potential remains. ALANET's parent company, the American Library Association, has over 50,000 members worldwide. These members are all potential ALANET subscribers.

Vendor

ALANET
℅ American Library Association
50 E. Huron Street
Chicago, IL 60611
(312) 944-6780
In Canada:
Contact the U.S. office.

Analysis

ALANET is the American Library Association's Electronic Information Service. ALANET features electronic communications, information services, on-line databases, and gateways to databases offered by VU/TEXT Information Services, Inc. and Dow Jones News/Retrieval. ALANET also designs and implements custom networks.

In addition, ALANET offers Telebase Systems, Inc.'s EasyNet gateway service, which provides menu-driven access to more than 900 databases offered by leading on-line vendors. ALANET also offers a variety of on-line games, business programs, statistical and other computational programs, and programming languages.

All of ALANET's services are geared to the library/information science community. ALANET is a value-added reseller of *BT TYMNET*.

Company Background

ALANET, the American Library Association's Electronic Information Service, grew out of the ALA's two-year experiment with electronic mail. The service, launched in January 1984, has approximately 1,800 users worldwide. ALANET's subscribers are almost exclusively librarians—public; academic; and, to some extent, corporate. Other ALANET users include representatives of publishers, information retrieval services, and companies that provide services to libraries.

ALANET offers the following services:

- *Electronic Communications*, including electronic mail, interactive forms, a Telex interface, and document uploading and downloading.
- *Information Services*, geared to librarians and other information specialists. These services include electronic newsletters such as *ALA Washington Newsline* and *Intellectual Freedom Alert*. ALANET also features a system-wide bulletin board.
- *Networking Support Services*, including the design and implementation of interlibrary loan networks, committee/board communications networks, and private bulletin boards.
- *Database Services*, providing access to external databases and Telebase Systems, Inc.'s EasyNet gateway services.

Additionally, ALANET provides services that support a variety of networking needs. Groups can select bulletin boards, customized interactive forms, menus, or electronic newsletters.

Competitive Position

ALANET is one of a growing number of on-line services dedicated to a market niche—the library and information professional community. The library community represents a viable market for an information retrieval service. At roughly 1,800 passwords issued, however, ALANET's user base remains small and has not grown much in the six years since it began.

With respect to its electronic newsletters and other services focusing on library science topics, ALANET has no direct competition. Much of the information that ALANET offers emanates from the American Library Association and is not available through any other on-line vendor. For its on-line databases, ALANET competes with DIALOG, which is well entrenched among the library community. For its electronic mail services, ALANET competes with Tymshare's OnTyme II system, brokered by the Cooperative Library Agency for Systems and Services (CLASS). DIALOG's Dialmail also competes with its ALANET's E-Mail service.

Resources and Facilities

ALANET is located within the headquarters of the American Library Association in Chicago, IL.

Support/Sales and Marketing Services

ALANET is marketed solely from the American Library Association's home office. The service is marketed through space advertising; direct mail; conference exhibits; and, of course, word of mouth.

For information on using the ALANET system, call ALANET directly at (800) 545-2433 (electronic mail—41:ALA0006), or contact BT ▶

Table 1. ALANET's Services and Associated Costs

Item	Service	Cost
Service Plans		
Full Service	Multiple mailboxes (three included; more as options)	$45 sign-up fee (onetime, nonrefundable)
Organizations or individuals	Full documentation including Dialcom User Guide (1) ALANET Miniguide (1) Quick Reference Card (3) Access to all communications, database, and information services	$99-per-year annual billing fee plus actual usage, billed monthly (no monthly minimum usage charge)
Intermediate Service		
Organizations or individuals	1 mailbox only Access to communications and ALA information services; excludes databases	$15 sign-up fee (onetime, nonrefundable) $30 per year annual billing fee plus actual usage, billed monthly (no monthly minimum usage charges)
Conversion Fee	To change service plans	$10 onetime (current ID-holders only)
Additional Options		
IDs (mailboxes)		
Extra IDs (full service only)	No maximum; 35 IDs per billing fee	$5 each (onetime)
ID reassignment	To change ID assignment or status	$5 each (onetime)
Limited service IDs	For restricting user access to services	Free at sign-up: $5 each to reassign
Hard Copy Directories	Quarterly list of all active ALANET IDs	One free per subscription, $2 each additional copy (quantity prices on request)
ID Storage Charge	Maintains ID and "name" files	$1.50/month per ID
Official Airlines Guides	Air travel and bookings, plus hotel information	
Connect time Schedule data Hotel, motel data Fares, rules data	Per minute	Surcharges for services: $0.70 prime, $0.55 nonprime
UMI Article Clearinghouse	Order articles and dissertations online, at lowest rate—no deposit account required	Connect time only (no surcharge)
Gateways	Access to other databases on external computers	
EasyNet	Access to databases, especially for information professionals	Connect time + $6/hour network call for EasyNet, plus db charges (more info on request)
EBSCONET	Serials database and control system	Connect time + EBSCONET charges (by subscription)
VU/TEXT	Full-text newspaper databases; detailed information on request	Connect time + $10/hour network call to VU/TEXT plus usage charges at special discounted rates (by subscription)
Special Services	Offerings to individual and group subscribers	
Custom Menu	Custom menu access to services	$200 per year

Table 1. ALANET's Services and Associated Costs (Continued)

Private Bulletin Board	For group exchanges, conferences information	
Setup	For special files, user validation	$50 onetime
Category	For each board category	$25 per month each
Text	Unlimited notices posted in each category	$20 per month per category (total $45 per month)
Forms Design	Customized, for ILLs, etc.	$50 each onetime
Electronic Newsletter	For group information needs; requires a menu	For 1 issue online, 5 to 10 typed pages: (other applications on request)
Setup	Required special files	$135 onetime
Manual	Guide to newsletter system	$25 per copy
Issue text	Actual newsletter copy	$120 per month
Training, Consultation	For groups or organizations	
Full day	One full or two half-day sessions	$500 per day + travel
Half day	One half day only	$425 + travel
Workshop	Training at ALA Conferences	$50 per attendee
Booklist and RBB Reviews Online	Advance reviews of new recommended books	$13/hour surcharge
GRAPEVINE	Early notice of library jobs	$11/hour surcharge
Training Materials		
ALANET Miniguide Version 2.0, 1987	Quick guide to system	$9 each; quantity discounts on request
Dialcom User Guide	Complete guide to system	$36 + $2.50 shipping
Database guides	For BNA, OAG, ALANET PLUS	Free on request
External Databases		
BNA Online	Tax, legal, regulatory, congressional issues	$85/hour surcharge
Business Wire	Business press wires (in News)	$30/hour surcharge
Dow Jones News/Retrieval	Stock, financial, business, and other current information	Surcharges vary per service; information on request
Electronic News	UPI, Business Wire, OPEC, and other wires	$20/hour surcharge $17/hour nonprime
NEWSTAB news clipping service	Instant delivery of profiled news stories	$1/day per term + $0.25 per story mailed ($0.30 for Business Wire)
FAR Online	Federal acquisitions regulations	$32/hour surcharge
FEDNEWS	News from 10 federal agencies	$20/hour surcharge $17/hour nonprime
FEDWIRE	News briefings, hearings in full-text transcripts	$20/hour surcharge

▶ *(Analysis continued)*

TYMNET at (800) HELPDIA. ALANET suggests that subscribers who contact BT TYMNET for customer support identify themselves as ALANET users and ask for *Telecom Support*.

ALANET documentation includes a *Miniguide* ($9 postpaid); a *Dialcom User Manual* ($36 plus $2 shipping); a *BNA Pocket Guide* (free); and a *VU/TEXT User Manual* (included with $35 VU/TEXT subscription).

Pricing

Two subscription plans are available: Full Service and Intermediate Service. The *Full Service* plan requires a onetime sign-up fee of $45 plus an annual billing fee of $99. Full Service includes full documentation, access to all services, and multiple mailboxes. *Intermediate Service* subscribers pay a sign-up fee of $15 and a $30 annual billing fee. Intermediate Service provides one mailbox, the ALANET *Miniguide*, and access to communications and ALA information services. Access to external databases is not included under this option.

Table 1. ALANET's Services and Associated Costs (Continued)

Text Storage Charges	Based on monthly rate per block or fraction thereof; 1 block—2,048 characters (½ typed page)	$0.50/month per block Quantity prices (over 2,500 blocks) on request
Communications Services	Mail, forms, etc.	All services incur connect time plus kilocharacter traffic charges; surcharges apply to premium services
Kilocharacter Traffic	Charge per 1,000 characters transmitted or displayed	$0.06 per kilocharacter
Connect Time via Telenet, Tymnet, Datapac, Dialcom net	300, 1200, or 2400 baud	
Prime time	8 a.m. to 6 p.m. Eastern time M-F	$20.50/connect hour
Nonprime time	Nights, weekends, holidays	$16.50/connect hour
via 800 number	For areas not served by public data network	
Prime time		$11/hour surcharge
Nonprime time		$11/hour surcharge
Telecommunications	Access to public data networks	Included in connect time
File transfers		
PCMAIL or WPMAIL, FT (File Transfer)	Batch mail prepared offline: upload/download spreadsheets, word processor formatted documents	$2/hour surcharge
XMAIL	Interface to Telex network; each ID has unique inbound Telex address	$5 per ID registration; XMAIL charges are connect time plus Telex charge by carrier
>LEARN	Online tutorial	Connect time only
Bulletin Boards	Exchange of information, ideas, announcements	$0.20 per notice posted $0.10 per minute connect surcharge
INFO INFO	Games, business and computational programs	Connect time only
Interactive forms	For ILLs, purchases, claims	Connect time only
Electronic Newsletters		
DCNEWS, OIFALERT, electroCitations, conference calendars, etc.		
ALANET and ALA unit newsletters and information services		$9/hour surcharge

Connect time rates are from $20.50 per hour (prime time). In addition, other services, such as ALANET databases, carry surcharges. For further information, see Table 1.

Networking Services

ALANET can be accessed through the SprintNet (Telenet), Tymnet, or Datapac (in Canada) telecommunications networks. It can also be accessed through BT TYMNET Direct Dial service (available in Washington, DC and New York City, and through an 800 number) and international networks.

Gateways

Via a gateway arrangement, ALANET subscribers can connect directly from ALANET into the VU/TEXT information retrieval service, which offers on-line newspaper files and other databases. Also available is a gateway to FEDNEWS, which provides electronic newsletters and other files from a variety of federal agencies including the Bureau of the Census, the Department of the Interior, NASA, and the U.S. Army. Another gateway, EBSCONET, enables users with an active EBSCONET account to search EBSCO's databases of serial and publisher information. Finally, FEDWIRE, available on BT TYMNET, reports on major briefings and speeches by U.S. and foreign officials.

In addition to the gateways mentioned previously, ALANET provides access to a number of external databases.

On-Line Databases

ALA Headquarters Library's Referral Directory	a guide to more than 200 reference questions frequently addressed to the ALA Library staff.
ALA Washington Newsline	a newsletter published at least bimonthly, produced by the ALA's Washington, DC office.
ALA News Bulletin	a newsletter offering current ALANET and association news.
BNA ONLINE	a collection of five electronic newsletters providing notification of legal, legislative, and regulatory developments in the areas of business, finance, taxation, labor, law, securities, environment, and tax.
Booklist	reviews from *Booklist*'s "Upfront" section, which summarizes key materials that will be high-demand titles in any library. On-line reviews appear approximately three weeks before they appear in the printed version of Booklist.
DIALCOM Electronic News	a compilation of several newswire services: United Press International (UPI), Reuters, OPEC News Agency, International Medical Tribune News Syndicate (IMTS), and Agriculture News (USDA).
electroCitations: ALA Publications News	a monthly file of citations to new publications from all ALA units.
GRAPEVINE	an electronic "first alert" job listing service for the library community.
Intellectual Freedom Alert	a newsletter that tracks censorship issues, produced by the ALA's Office for Intellectual Freedom.
KIDSNET	a clearinghouse for children's television and radio programming information.
Reference Books Bulletin	reviews from *Booklist*'s *Reference Books Bulletin*. Reviews appear in ALANET approximately six weeks before they appear in print.
The Official Airlines Guide (OAGEE)	contains the world's commercial airline flight schedules. *OAG* includes detailed fare information for both domestic and international flights, and hotel information for most major cities.

Other Services

Electronic Mail

ALANET offers a full-featured electronic mail system, featuring automatic acknowledgments, express messages, and group mailings. ALANET users can communicate electronically with each other and with any BT TYMNET ID-holder.

Subscribers can also use their ALANET IDs to send Telex messages to any Telex or TWX machine worldwide. Similarly, users can receive Telex messages after obtaining their IDs' inbound Telex address. Subscribers can also use their IDs to send Mailgrams and international cables.

EasyNet

ALANET offers a customized version of Telebase Systems Inc.'s EasyNet information gateway service. It provides access—via two routes—to more than 900 databases offered by several leading on-line vendors, including DIALOG, BRS, SDC, and VU/TEXT.

The first route, intended for those new to on-line searching, selects the database that will best serve the user's needs, based on responses to menus. The more than 40 databases highlighted through these menus fall into the following categories:

- Library and information science
- Information resources
- Management and administration
- Software and data processing
- "Other databases" (provides access to all 900 databases available through EasyNet)

Among the databases are *Library Literature*, *Library and Information Science Abstracts*, *ERIC*, and *Books in Print*.

The second route allows users to bypass the menus and directly select the particular database to be searched. It provides access to the full complement of 900 databases available through the EasyNet system.

ALABOARD

ALABOARD, ALANET's system-wide bulletin board, is divided into six categories: microcomputers; idea exchange; sale or trade; ALANET news; restaurants; and reference stumpers. Users can scan or read existing messages, respond to existing messages, or create messages of their own.

Custom Network Services

ALANET will develop and implement private networks for communications, bulletin boards, interlibrary loans, and other cooperative activities. Prime candidates for such networks include state library agencies, networks and consortia, associations, and committees. Among the networks ALANET now supports are:

- *NYLINE*—the New York Library-Line
- *SLOLINE*—the Ohio State Library Network
- *MCAT*—Missouri State Library

Sponsoring organizations have access to the ALANET electronic mail network of more than 1,800 electronic mailboxes; a range of special services is also available.

INFO INFO

Through BT TYMNET's INFO INFO service, users have access to a variety of on-line games, business programs, statistical and other computational programs, and programming languages.

UMI Article Clearinghouse

This is a clearinghouse for on-line ordering of periodical articles. ALANET users receive UMI's lowest rate for article reprints with no deposit account required. Dissertation can also be ordered on-line.

Future Plans

ALANET plans to continue adding library- and information-oriented services drawn from the American Library Association's resources. To a lesser extent, ALANET also plans to add additional databases produced by outside vendors. The *KIDSNET* service, a computerized clearinghouse for children's radio and television information, is an example of such an "outside" database.

ALANET will continue to support group networking and communications services. The company feels that many people in its target market either underuse electronic mail, or do not use it at all. Consequently, its opportunities for expansion are great. ■

Automatic Data Processing, Inc. (ADP)

COMPANY INFORMATION

Automatic Data Processing, Inc. (ADP)
1 ADP Boulevard
Roseland, NJ 07068
Telephone (201) 994-5000

Company Background

Automatic Data Processing, Inc. (ADP) was founded in 1949 as a manual payroll processing service. A favorite among securities analysts, ADP has enjoyed consecutive quarters of double-digit growth in both revenues and earnings since going public in 1961. ADP is now generally considered the world's leading independent computing services company.

Organizationally, ADP's services are divided among four principal groups: Employer Services (ES), Brokerage Information Services, Automotive Information Services, and Specialized Services. These services are offered through a variety of computing methods: batch, on-line, and via computers installed at the customer's site (ADP Onsite Service).

Through its Brokerage Information Services Division, ADP offers a number of business-oriented databases geared to banking and industrial firms.

For the fiscal year ending June 30, 1988, ADP reported record revenues of $1,549,157,000, which represents a 12 percent increase over the previous fiscal year. ADP employs more than 23,000 people.

Competitive Position

ADP is one of the top companies in the highly competitive computing services industry. ADP numbers among its competitors banks and other independent computing services companies. Companies that have established in-house computing services facilities also cut into its business.

In the realtime securities market, a market that ADP entered relatively recently, it faces stiffer competition. There, ADP competes with industry leader Quotron, as well as with Reuters. ADP, however, is viewed as a formidable competitor. Currently, it offers services to a base of more than 25,000 quotation terminal subscribers. ADP is developing customized quote services for both Merrill Lynch and Shearson Lehman Hutton, with initial rollout on target for this year. Analysts believe ADP is well positioned to capitalize on the increasing automation of the financial services sector, the growing recognition of information's value, and the continued growth in the use of personal computers.

Based in Roseland, New Jersey, Automatic Data Processing (ADP) is the world's leading independent computer services company. ADP was founded in 1949, and its roots are in payroll processing and in providing employer-related services.

While these areas still represent a significant part of its business, ADP also offers on-line information services through its Data Services Division. These services include realtime news and quotations services including more than 30 business-related databases. ADP's databases are primarily numeric and provide statistical information for banking and industrial firms.

This report highlights ADP's information retrieval services. For additional information on ADP's time-sharing capabilities, see Report RC20-066-101.

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RESOURCES AND FACILITIES

Processing Centers

ADP Employer Services maintains 40 processing centers in the United States and 9 others located in Canada, Europe, and South America. IBM 4300 systems are the mainstay computers at most of these sites. Commercial Services also uses the Microdata Reality series of minicomputers for its accounting application services.

ADP's banking services division has data centers devoted primarily to bank processing in Chicago, Illinois and Cherry Hill, New Jersey. An ADP acquisition, Total Systems, supplies computing services to savings and loan mortgage bankers via a data center located in Texas. Other savings and loan institutions are serviced from Mt. Laurel, New Jersey and Cincinnati, Ohio. Brokerage services are provided from data centers in New York, Jersey City, and Cherry Hill, New Jersey. ATM processing is in Clifton, New Jersey, and commodity trading services are provided in Chicago, Illinois.

For ADP on-site distributed processing service, a Digital Equipment Corporation 2020 central processor, expandable to over 2 million bytes of memory, can be configured in systems with up to 1.5 billion characters of on-line storage, three line printers, four tape drives, 32 local terminal interfaces, and a front-end communications processor.

ADP Dealer Services operates more than 15,000 factory/dealer terminals as part of its accounting and management information service for franchised new car and truck dealers. Collision repair estimating operations are centered in San Ramon, California; real estate management is performed in Rockville, Maryland.

Customer Support Services

ADP supports its customers via a network of 86 sales and data center facilities in the United States, 22 offices located in Europe, and 3 in Brazil. A 24-hour Data Hotline service is available to assist users in all aspects of ADP database usage.

Sales and Marketing Services

ADP's market strategy is to provide computing services through its international teleprocessing network, through an on-site business system, or by processing and delivering the data overnight so that ADP customers can draw upon as much computing power as they need, when they need it, paying only for what they use.

INDUSTRY-SPECIFIC SERVICES

Collision Estimating Services

ADP offers computerized automobile collision repair estimates for insurance companies, claims adjusters, and repair shops through its Collision Estimating Services Division. The division uses a computerized database containing essential repair information for parts and labor covering more than 4,000 different domestic and foreign cars. This represents approximately 96 percent of all 1970 and later cars in use in the United States. The division also provides damageability statistics used by insurance companies, auto manufacturers, and government agencies in the premium pricing process and auto design analysis. Clients include insurance companies, auto manufacturers, body shops, independent appraisal companies, and owners of large auto fleets. In addition, the division's Parts Inventory Control Service furnishes a master reference listing, inventory analysis reports, automatic stock order preparation, manufacturer price tape and updates, local/regional/national parts locators, and over 40 different operating reports available on demand. Finally, the division's Dealer Communications Systems include warranty claims information, new vehicle orders, administrative messages delivery reporting, status inquiry, and submission reports.

Manufacturers

ADP's *MANAGE-2000* is a fully integrated, interactive MRPII system used by discrete and repetitive manufacturers producing a wide range of products. MANAGE-2000 is available for sale or lease as an in-house business solution for small-to-medium sized manufacturers.

The human engineering applications include inventory and production management, bill of materials, purchasing, bucketless net change or regenerative MRP, routings, shop floor control, job costing, capacity planning, sales order processing, accounts receivable, accounts payable, general ledger, and payroll. Also available are multifacility MRP, configure-to-order options for sales order processing, and a Kanban (JIT) materials flow system. Using the ADP PC connection, the client can also provide data directly to IBM PC-based applications such as Lotus and WordStar. MANAGE 2000 also provides access to a screen management system, a menu maintenance system, and an interactive report builder.

These modular applications are available on hardware using the Pick Operating System.

Brokerage Industry Service

ADP offers backoffice stock brokerage and related financial computer services. These include brokerage processing, case management, stock loan accounting, on-line inquiry and data collection, portfolio reporting, order matching, and on-line trading. It also provides computing services to brokers and traders in commodity contracts, commodity futures, and options.

ADP's front office database and quotation services are geared to the investment and brokerage community. They include the provision of quotations, financial news services, and other information to terminals located on brokers' desks. ADP offers the traditional "dumb" terminals. It is also, however, installing the next generation of terminals—interactive microcomputer-based workstations. In addition to these services ADP provides predominantly on-line, realtime services for all commodities, currencies, interest rate futures trading, and equity securities to clients in the U.S., Europe, Canada, and Hong Kong.

Wholesalers/Distributors

ADP's *Distribution 2000* is a fully integrated, interactive, industry-specific system. Distribution 2000 is available for sale or lease as an in-house business solution for wholesalers and distributors.

Distribution 2000 provides system analysis, application software, operating system complete with maintenance, ongoing software enhancements with automatic operating system updates, data conversion, setup of hardware and software, training on hardware and software, and complete ongoing client support. Applications provided include order entry, inventory management, purchasing management, business performance analysis, accounts receivable, accounts payable, general ledger, bill of materials, and extensive sales analysis.

Distribution 2000 can be linked through the ADP Connection to leading PC-based productivity programs such as Lotus 1-2-3 and WordStar.

MICROCOMPUTER/SOFTWARE SERVICES

Screen

ADP offers a variety of software packages to facilitate data analysis. Included among these packages is *Screen,* a database screening and reporting system that the company claims is easy to use, yet contains powerful commands that enable users to quickly research a screenable financial database for entries that meet specified criteria. The entities commonly reported in a screenable database are companies, banks, and/or segments of companies. ADP also offers *MicroSCREEN*, a powerful, menu-driven version of Screen.

InQuery

InQuery is ADP's Information Query system—a single PC-based communications software package for a wide range of financial databases including:

- Mergers and Acquisitions
- Compustat
- Disclosure
- Stock Prices
- M&A Advisers
- I/B/E/S
- Bancall
- Bancorp
- Savings and Loan
- Insider Trading
- Exstat

InQuery stores all setup information to speed the logon process. It also includes a report writer feature, which enables users to build reports on-screen, visually displaying layout and data requested. Reports can be formatted for compatibility with major software packages such as Lotus 1-2-3.

A "lookup" feature includes information (e.g., SIC codes, ticker, or bank ID) relevant to the databases the package is commonly used to access.

NETWORKING SERVICES

Organizationally, these services are provided by ADP Network Services. ADP operates its worldwide packet switched network from three computer centers in Waltham, Massachusetts; Ann Arbor, Michigan; and London, England—where groupings of DECSYSTEM-10 computers are configured into large-scale systems. Two hundred communications control computers are integrated into this network for toll-free access from three hundred principal cities in North America and Europe.

ON-LINE DATABASES

ADP offers a series of databases derived from proprietary and nonproprietary sources that contain information ranging from short-term economic forecasts to cost-of-living indexes. In addition to providing ad hoc reporting capabilities through its *Screen* and *InQuery* software packages, most of its financial databases also have a complete set of standard reports available.

Detailed information for many of these databases may be found in the On-line Databases section (OL40) in Volume 1 of this publication.

Corporate Financial Data

ADP's corporate financial databases provide information from the income statements, balance sheets, and funds flow statements of public corporations. Cash flow data and industrial classification information is also provided. In addition, ADP adds stock market prices and provides key ratios.

This data, combined with ADP's software, can be useful when analyzing mergers and acquisitions, divestitures, investments, and industry trends. It is also useful in performing market share and competitive studies, evaluating corporate performance, managing pension funds, and forecasting.

Disclosure ONLINE—contains financial and narrative data on public companies. This data is updated weekly and is extracted from annual and periodic reports filed with the U.S. Securities and Exchange Commission.

Compustat/Line of Business—includes summary financial data on 6,000 top U.S. companies, by line of business. Up to 90 lines of business are identified for each of the more than 12,000 companies profiled. The database contains up to seven years of company data and is updated weekly.

Compustat/Industrial—contains financial data for more than 7,000 industrial firms whose stock is traded in the U.S., plus key Canadian firms. The database contains up to 20 years of annual data and 10 years of quarterly data from balance sheets, income statements, statements of

Automatic Data Processing, Inc. (ADP)

change in financial position, operating statistics, and market items. The database is updated weekly.

Compustat/Utility—contains financial information for the largest U.S. utilities and their subsidiaries. The database is updated weekly.

Compustat/Geographic—provides summary financial data on the top 3,500 U.S. corporations by geographic region and their foreign operations (by country). The database includes up to seven years of data on sales, operating income, assets, capital expenditures, and depreciation. Total export sales are reported for each company. The database is updated weekly.

Compustat/Telecommunications—contains financial data for the largest U.S. telecommunications firms and their subsidiaries. Up to nine years of annual and five years of quarterly data from balance sheets, income statements, statements of change in financial position, operating statistics, and stock market information is available.

Compustat Research—historical annual data for more than 4,800 companies no longer reporting due to acquisition, bankruptcy, or change to private ownership.

The M&A (Mergers and Applications) Data Base—provides full details on all tender offers, mergers, buyouts, and divestitures, valued at $1 million and above, 1979 to the present. The database helps formulate M&A pricing, structuring, and strategies; it is updated daily. It currently covers more than 32,000 "deals."

M&A Adviser Data Base—information on advisers and the type of advice given on merger and acquisition deals. Data can be ranked on the number of deals advised, value of the deals, and fees paid to advisers.

Exstat—provides financial information on more than 4,000 British, European, Australian, and Japanese companies. Ten years of historical data, from annual balance sheet and profit and loss account data to net asset value and earnings, is provided for each company.

Banking Data

ADP's banking databases include information from financial statements required by the institutions' insuring agencies. In most cases, the databases include predefined analytical ratios to simplify analysis. Geographic information is also included.

Typically, this information is used in market share studies, merger and acquisition prospect screening, correspondent bank surveys, performance analysis, forecasting, and peer group analysis.

Bancall II—derived from the Federal Reserve Call Reports, Bancall II contains financial information on 14,000 FDIC commercial banks, including six years of historical data. A special report writer is highly useful in performance analysis, market share studies, acquisition product screening, correspondent bank surveys, and peer group analysis. Updated quarterly.

Bancorp—contains balance sheets and income statements for U.S. bank holding companies. Begins with data in Y-9 Supplement and adds information on each bank subsidiary, plus stock market data. Updated quarterly.

Compustat/Banking—contains annual data since 1961 and quarterly data since 1970 for the largest U.S. bank holding companies, including balance sheet, income statement, and market information.

Savings and Loan—contains information since 1977 on more than 4,000 federally chartered Savings and Loan institutions; updated quarterly.

MSB FDIC-Insured Savings Banks—data compiled from FDIC financial reports for more than 400 savings banks and mutuals. Quarterly data starts with December 1986; cumulative data is included as well. Retroactive adjustments are made for format changes.

Business and Industry Statistics

ADP's statistical databases provide historical and forecast time series to help planners and analysts understand the current economic environment and the conditions likely to prevail in the future. Statistical aggregates include industry-specific details for the following categories:

- Automotive industry
- Bank assets and liabilities
- Capital expenditures
- Consumer credit
- Consumer spending
- Employment
- Energy
- Foreign trade
- Housing
- Industrial production
- Money markets
- Orders and inventories
- Personal income
- Prices
- Shipments

This information is essential in developing sound competitive strategies. ADP's data and analytical programs can also help users project interest and inflation rates, determine future industry trends, identify growth markets, evaluate pricing scenarios, analyze capital expenditure plans, and forecast costs and cash flows.

U.S. Econ (U.S. Economic)—a heterogeneous collection of historic time series on major sectors of the U.S. economy from 1947 to date; updated daily.

Automatic Data Processing, Inc. (ADP)

▷ *U.S. CPI (Consumer Price Indexes)*—indexes for cost of living for wage earners and clerical workers and all urban consumers; 1947 to date; updated monthly.

U.S. PPI (Producer Price Indexes)—indexes for the cost of wholesale goods; 1967 to date; updated monthly.

U.S. FLOW (Flow of Funds)—produced by the Federal Reserve Board, contains 4,300 time series describing the sources and uses of funds in the U.S. economy from 1952 to date; updated quarterly.

International Data

QIFS/MIFS (International Financial Statistics)—a source of financial and economic information on over 160 world economies; updated monthly (MIFS) and quarterly (QIFS).

Investment Data

ADP's investment databases contain prices and related data for securities and foreign currencies. Current data is complemented by extensive historical information. Validation and backup routines ensure accuracy and reliability.

These databases are highly useful in investment research and management, pension fund analysis, money and portfolio management, and for foreign exchange and security trading, accounting, and reporting.

Issues—contains historical daily prices, dividends, interest payments, and trading volumes for principal stocks, options, mutual funds, and corporate, municipal, and federal bonds traded in U.S. markets. This database is updated daily.

FX (Foreign Exchange)—features daily exchange rates on spot, one-, three-, and six-month forward rates for 35 major currencies; updated daily.

I/B/E/S (Institutional Brokers Estimate System)—provides monthly earnings-per-share estimates for stock issues of more than 6,400 companies.

Miscellaneous

Insider Trading—provides information on owners of publicly held companies.

OTHER SERVICES

Strategic Planning Services help managers set targets and develop strategies, including merger and acquisition analysis, goal-setting analysis, econometrics, competitive analysis, and databases.

Project Management Services employ APECS to schedule, coordinate, and financially evaluate large complex projects with up to 64,000 activities.

Applications Development Service consists of systems and programming specifications, programming, program testing, system testing, user documentation, training, and maintenance.

ADP also offers a *conversion service* to adapt existing applications for use on the ADP Network. The conversion service can include program specifications and user documentation as required by the client. ☐

BRS Information Technologies

Established in 1976, BRS Information Technologies is one of the world's largest on-line information services. The company serves more than 60,000 subscribers and offers more than 150 databases covering health, medicine, pharmacology, the biosciences, science and technology, education, business and finance, the social sciences, and the humanities.

In addition to the *BRS/Search Service,* its main service, BRS offers *BRS/After Dark,* an after-hours, reduced-rate service. Another service, *BRS/Colleague,* provides easy-to-use, menu-driven access for medical end users. BRS also offers two services for educators—*BRS/Educator* (for K-12 educators) and *BRS/Instructor* (geared to library schools).

REPORT HIGHLIGHTS: PAGE
Competitive Position 103
On-Line Databases 105

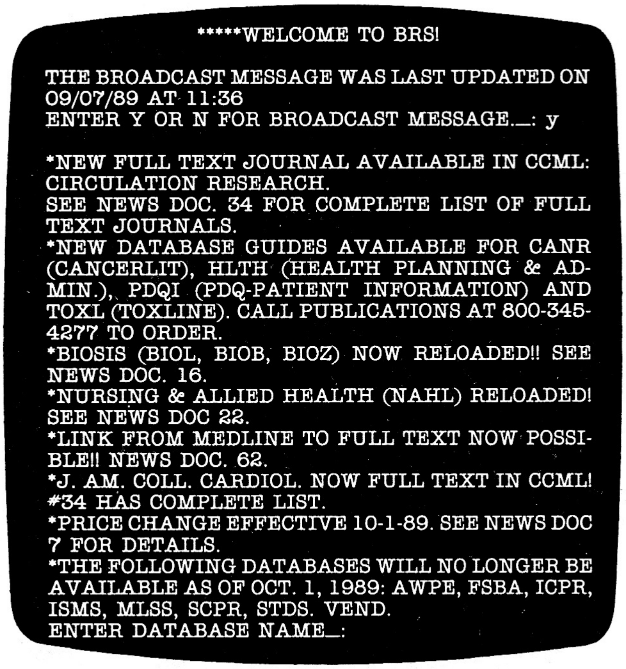
COMPANY INFORMATION

BRS Information Technologies
A Division of Maxwell Online, Inc.
8000 Westpark Drive
McLean, VA 22102 (703) 442-0900, (800) 345-4277

UPDATE: *Since our last update on BRS, the company has undergone some organizational changes. In the Spring of 1989, Maxwell Online, Inc. was formed. Maxwell Online, Inc. is a part of the Maxwell Communication Corporation/Macmillan Inc. organization. Under Maxwell Online, Inc., there are four operating divisions: BRS Information Technologies, BRS Software Products, ORBIT Search Service, and Pergamon Search Center. After acquiring BRS and ORBIT, Maxwell Communications and Macmillan have jointly become the world's premier supplier of on-line scientific, technical, and medical information.*

Company Background

Three employees of the Biomedical Communication Network of the State University of New York (SUNY) founded BRS Information Technologies in 1976. They wanted to provide cost-effective, on-line retrieval services to organizations with limited budgets—notably medical centers and academic libraries. At the time of its founding, BRS served 70 subscribers with 10 databases. Today, BRS is a division of Maxwell Online, Inc. It offers its 60,000 subscribers access to more than 150 databases. Primary markets for its services are libraries, medical and pharmaceutical firms, and physicians.



```
                 *****WELCOME TO BRS!

THE BROADCAST MESSAGE WAS LAST UPDATED ON
09/07/89 AT 11:36
ENTER Y OR N FOR BROADCAST MESSAGE_: y

*NEW FULL TEXT JOURNAL AVAILABLE IN CCML:
CIRCULATION RESEARCH.
SEE NEWS DOC. 34 FOR COMPLETE LIST OF FULL
TEXT JOURNALS.
*NEW DATABASE GUIDES AVAILABLE FOR CANR
(CANCERLIT), HLTH (HEALTH PLANNING & AD-
MIN.), PDQI (PDQ-PATIENT INFORMATION) AND
TOXL (TOXLINE). CALL PUBLICATIONS AT 800-345-
4277 TO ORDER.
*BIOSIS (BIOL, BIOB, BIOZ) NOW RELOADED!! SEE
NEWS DOC. 16.
*NURSING & ALLIED HEALTH (NAHL) RELOADED!
SEE NEWS DOC 22.
*LINK FROM MEDLINE TO FULL TEXT NOW POSSI-
BLE!! NEWS DOC. 62.
*J. AM. COLL. CARDIOL. NOW FULL TEXT IN CCML!
#34 HAS COMPLETE LIST.
*PRICE CHANGE EFFECTIVE 10-1-89. SEE NEWS DOC
7 FOR DETAILS.
*THE FOLLOWING DATABASES WILL NO LONGER BE
AVAILABLE AS OF OCT. 1, 1989: AWPE, FSBA, ICPR,
ISMS, MLSS, SCPR, STDS. VEND.
ENTER DATABASE NAME_:
```

Figure 1. The BRS welcome screen gives users the option of reading system announcements (the broadcast message).

A comprehensive information retrieval system, *BRS/Search* software provides database creation, updating, information retrieval, and reporting capabilities from large mainframes to small personal computers. The Micro/Mini version retains most of the functional capabilities of the Mainframe version. It also allows nonprogrammers to load databases directly. *BRS/Search Service* contains a complete electronic library with databases covering almost every major discipline:

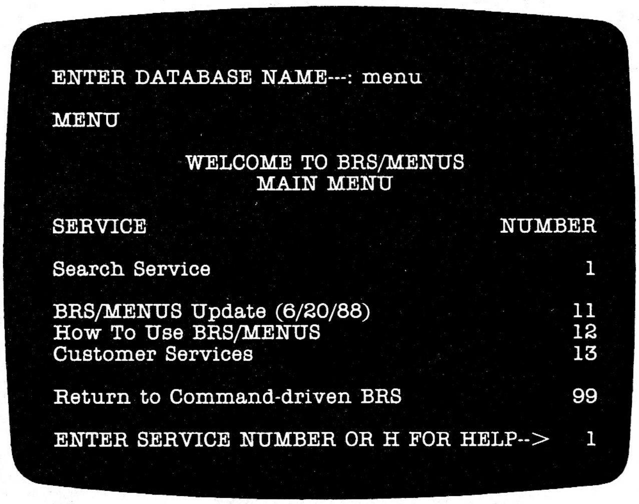
- Health
- Medicine
- Pharmacology
- Biosciences
- Science and technology
- Education
- Business and finance
- Social sciences
- Humanities

The databases include current and historical information from journal articles, books, dissertations, and government reports. Some databases serve as detailed indexes to available literature while others include abstracts and complete text.

BRS/Search Service has special subscription plans available. *BRS/Educator* is specially priced and is exclusively available for professionals working in a K-12 educational

▷

BRS Information Technologies



```
ENTER DATABASE NAME---: menu

MENU

                    WELCOME TO BRS/MENUS
                         MAIN MENU

SERVICE                                        NUMBER

Search Service                                      1

BRS/MENUS Update (6/20/88)                         11
How To Use BRS/MENUS                               12
Customer Services                                  13

Return to Command-driven BRS                       99

ENTER SERVICE NUMBER OR H FOR HELP-->               1
```

Figure 2. BRS/Menus is a menu-driven, but full-featured, service. The welcome screen is shown here.

setting. It offers a wide range of databases that cite leading authorities in the education field.

Also, *BRS/Instructor* offers low rates for instructional purposes in supervised programs, specifically for the elementary to graduate levels. This plan is designed to enhance the teaching of on-line searching techniques and is used by most major library schools.

For evening and weekend users, BRS has another service— *BRS/After Dark*, a menu-driven service that offers the most popular databases contained in the *BRS/Search Service*, at reduced rates. *BRS/After Dark* is available for a onetime subscription fee of $75 (plus a monthly minimum of $12) with a charge of $8 per connect hour and database royalties. *BRS/After Dark* is not available outside North America. Another key service that BRS offers end users is *BRS/Colleague*. An on-line medical knowledge service for medical professionals, *BRS/Colleague* was designed specifically for clinicians and researchers. This user-friendly system requires no programming or computer skills. When connected to Colleague, a subscriber can choose from a "menu" of libraries and, in response to a series of prompts, use simple English to retrieve the desired information.

Included in the service are database libraries containing *MEDLINE* and *Health Planning and Administration* from the National Library of Medicine, *Medical and Psychological Previews* from BRS, and *International Pharmaceutical Abstracts*. Another file, the *Comprehensive Core Medical Library*, contains the full text of major medical journals and medical books. Colleague databases can be accessed 22 hours per day.

Other special BRS features include off-line printing. The user orders the results of an on-line search to be printed by BRS, and the printout is mailed to the user the following day. This feature is available on all the services.

BRS also offers convenient search features such as Selective Dissemination of Information (SDI). Users can store their search profile(s) and BRS will automatically run the search whenever the specified database(s) is updated. Then, the results of the search can be sorted to individual specifications and forwarded by first-class mail. This feature is available with all of the services.

HITS, another feature offered by BRS, displays all paragraphs/fields and subparagraphs of text in which the search terms occur. HITS is available on the *BRS/Search Service* and the *BRS/After Dark*.

Many of the databases available on all of the BRS services are full-text. They provide access to the journal articles, monographs, and textbook chapters, or directory entries that they may cover. The user can therefore read the contents of a retrieved document on-line. The software included provides powerful search and display features that are custom designed to enhance the use of lengthy, full-text documents.

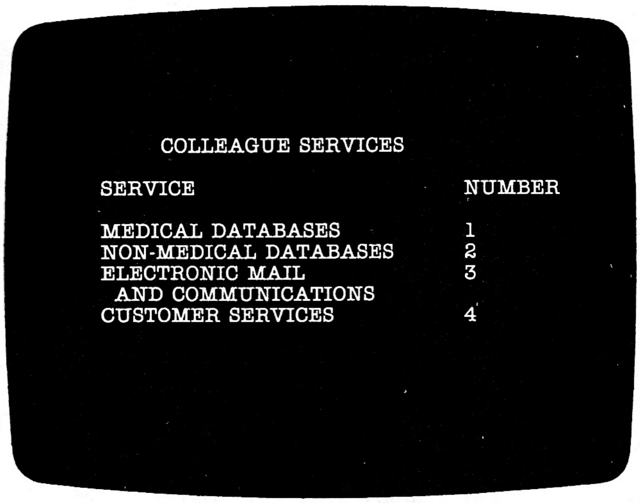
The CROS database search feature enables the user to search all or selected groupings of BRS databases at once. This feature is exceptionally valuable when searching for information on an interdisciplinary or elusive subject. The CROS feature is available on the *BRS/Search Service* and *BRS/After Dark*.

BRS' newest search feature, BRS LINK, was released in May. LINK is an automated, cross-database searching feature for the BRS on-line services. LINK indicates when there are documents in another database that complement already retrieved documents. A LINK command causes BRS to automatically retrieve them.

TABLE 1. SUBSCRIPTION PLANS WITH DISCOUNT SCHEDULE

	Annual Commitment ($)	Monthly Minimum ($)	Hourly Discount* ($)
Open Access Plan	0	0	0
Advance Purchase Plan	1,000	—	6.00
	7,500	—	7.50
	15,000	—	9.00
	50,000	—	10.50
	100,000	—	11.50
	200,000	—	12.50
Monthly Installment Plan	3,000	250	6.00
	7,500	625	7.00
	15,000	1,250	8.00
	45,000	3,750	9.00
	105,000	8,750	10.00
	210,000	17,500	11.00

**This discount is from the Open Access Rate.*
BRS/Search Service access plans.



```
        COLLEAGUE SERVICES

SERVICE                        NUMBER

MEDICAL DATABASES               1
NON-MEDICAL DATABASES           2
ELECTRONIC MAIL                 3
  AND COMMUNICATIONS
CUSTOMER SERVICES               4
```

Figure 3. Colleague's welcome screen shown here offers a variety of databases, as well as a way to check electronic mail.

Competitive Position

BRS' main competitor is the industry's largest on-line vendor, DIALOG. Now that BRS is an operating division of Maxwell Online Inc., it can be more competitive with DIALOG. Maxwell Online, Inc., the on-line arm of the Maxwell Communication Corporation/Macmillan Inc., has four operating divisions: BRS Information Technologies, BRS Software Products, ORBIT Search Service, and Pergamon Search Center.

Like many other on-line services, BRS is continuing to focus on the end-user market. That market, the actual users of information instead of the information intermediaries, is seen as the one that will allow the industry to greatly expand.

BRS has sampled success in the end-user market, with its phenomenally successful *BRS/Colleague* service. Colleague, a menu-driven on-line service for physicians, now has over 30,000 subscribers and continues to grow.

BRS attributes Colleague's success partly to the nature of the physician market. (One of Colleague's major attractions is the *AIDS Knowledge Base*, an exclusive database from San Francisco General Hospital.)

Physicians are not the only end-user market the company is targeting. BRS is also focusing on improving its business databases to draw more businesspeople to its subscriber ranks. Business files recently added include *ABI/Inform*, *PTS/PROMT*, and *Trade & Industry ASAP III*, a full-text database.

RESOURCES AND FACILITIES

Processing Center

BRS Information Technologies and ORBIT Search Service will soon benefit from enlarged data center facilities in Chicago, Illinois. The center is located at the corporate headquarters of Official Airline Guides (OAG). ORBIT relocated its Reston, Virginia data center in August 1989, and BRS planned to relocate from Latham, New York to Chicago before the end of 1989.

This new data center offers increased processing capacity, extensive network monitoring facilities, and a back-up power supply which will prevent disruption of service in a power failure. The move will go unnoticed by the users, and there will be no downtime during the relocations.

System Software

The BRS on-line software for mainframes or microcomputers is available to clients for lease or purchase.

OPERATING SYSTEMS: The Micro/Mini version of *BRS/Search* runs under the UNIX operating system (UNIX Version 7 or UNIX System 3). It also runs on a wide variety of microcomputers and minicomputers such as Digital PDP-11, Digital VAX, Onyx, Perkin-Elmer, and many more.

PROGRAMMING LANGUAGES: The Micro/Mini software is written in the C programming language.

Customer Support Services

Special support services offered by BRS help users become more proficient in the use of BRS products.

Customer Service. BRS customer services representatives have the training and experience needed to respond to questions. The toll-free number, (800) 345-4277, accesses BRS to handle any questions. North American customer service is available from 8 a.m. to 1 a.m. (E.T.) Monday through Friday; 8 a.m. to 5 p.m. (E.T.) Saturday; and 9 a.m. to 5 p.m. (E.T.) Sunday.

BRS Practice Databases. Subsets of major databases are offered for practice, demonstration, and instructional purposes. The subsets are offered at a reduced rate.

User Education and Training. Training sessions are sponsored by BRS throughout the U.S., Canada, Europe, and the Australasia region for beginning, experienced, and specialized users. For further details on education and training, contact BRS customer service at (800) 345-4277.

BRS Video Training Course. A video training course designed to give the user thorough basic training in BRS

TABLE 2. SDI (CURRENT AWARENESS) SERVICE

Database	SDI Frequency	Price ($)	Citation Charges after First 15 ($)
ABI/INFORM (INFO)	Monthly	9.50	0.77
Agricola (CAIN)	Monthly	5.25	0.12
Arts & Humanities SEARCH (AHCI)	Every 2 weeks	10.25	0.32-0.37
BIOSIS Previews (BIOL)	Monthly	9.00	0.21-0.38
Books in Print (BBIP)	Monthly	5.50	0.20
CA SEARCH (CHEM)	Monthly	13.50	0.24-0.62
CAB ABSTRACTS (CABA)	Monthly	7.95	0.07-0.34
CANCERLIT (CANR)	Monthly	5.25	0.11
COMPENDIX (COMP)	Monthly	8.25	0.34
Comprehensive Core Medical Library (CCML)	Monthly	9.50	0.32
Current Contents Search (CCON)	Weekly	*5.00	0.00-0.96
DIOGENES (DIOG)	Weekly	6.00	NA
Dissertation Abstracts Online (DISS)	Monthly	7.25	0.21
EMBASE (EMED)	Every 2 weeks	11.50	0.22-0.43
ERIC (ERIC)	Monthly	4.50	0.10
Exceptional Child Education Resources (ECER)	Monthly	5.50	0.17
FAIRBASE (FAIR)	Monthly	26.00	0.85
GPO Monthly Catalog (GPOM)	Monthly	4.75	0.10
Health Planning & Administration (HLTH)	Monthly	4.75	0.11
INSPEC (INSP)	Monthly	14.00	0.54
International Pharmaceutical Abstracts (IPAB)	Monthly	6.50	0.45
Legal Resource Index (LAWS)	Monthly	9.25	0.25
Magazine Index (MAGS)	Monthly	10.25	0.25-2.25
Management Contents (MGMT)	Monthly	8.50	0.40
Medical & Psychological Previews (PREV)	Monthly	5.50	0.16
MEDLINE (MESH)	Monthly**	4.75	0.11
National Newspaper Index (NOOZ)	Monthly	10.25	0.25
Nursing and Allied Health (NAHL)	Monthly	6.50	0.25
NTIS Bibliographic Database (NTIS)	Monthly	8.25	0.37
PAIS International (PAIS)	Monthly	8.25	0.15
PATDATA (PATS)	Weekly	6.25	0.11
PTS F&S&PROMT Merged (PTSL)	Weekly	9.50	0.62
PsycINFO (PSYC)	Monthly	5.25	0.10
Social SciSearch (SSCI)	Every 2 weeks	11.25	0.32-0.37
Sport Database (SFDB)	Monthly	8.50	0.28-0.34
TOXLINE (TOXL)	Monthly	4.75	0.11
Zoological Record (ZREC)	Monthly	9.25	0.17-33

**Rate for CCON does not include prints.*
***MEDLINE SDIs are also available twice a month as a user option in ACCT. The price remains $4.75.*
NA—Not applicable.
Shows pricing format for SDI service.

▷

search and display features is now available. It consists of a videotape and workbook. For more information, call BRS customer service.

Sales and Marketing Services

Most of BRS' marketing and administrative staff will be moving to Maxwell Online's corporate headquarters in McLean, Virginia. Some of the technical staff will stay at BRS' New York location and continue their development of *BRS/SEARCH*, the commercially available search software.

Along with the employees' relocation, Maxwell Online plans to significantly add to their staff, especially in the technical and marketing departments. Maxwell Online plans to expand the overseas marketing of BRS, marketing BRS in Europe through ORBIT's London office and in Asia through the Australian and Japanese offices.

Since the acquisition of BRS Europe, Maxwell Online has been able to consolidate the marketing of *BRS/SEARCH Software* around the world on a consistent basis.

PROCESSING SERVICES

Pricing

BRS offers three access plans to the *BRS/Search Service*, the Open Access Plan, the Annual Commitment: Advance Purchase Plan, and the Annual Commitment: Monthly Installment Plan. Table 1 lists these access plans. For further details, contact BRS customer service at (800) 345-4277.

▷

TABLE 3. TELECOMMUNICATIONS

Telecommunications within the U.S. and Canada are billed by BRS at the folowing rates:

	Per Hour ($)
Telenet	11
Tymnet	11
Direct Dial	3
Telenet In-WATS	29
Tymnet In-WATS	29
Telenet via Datapac	17
Tymnet via Datapac	17

BRS is also available through the IBM Information Network at the rate of $2.50 per hour plus IBM charges.

APPLICATION-SPECIFIC SERVICES

Information Retrieval

According to the vendor, the *BRS/Search Service* incorporates the best features of many on-line retrieval programs to provide one of the most advanced on-line searching systems currently available.

BRS says its system combines sophisticated and flexible searching techniques with an easy-to-learn, interactive language. Offering many capabilities not available on other systems, it is structured so that a user can sign on to the system, enter a complicated search strategy in a single step, retrieve results, and sign off with a minimum of interaction.

NETWORKING SERVICES

BRS network services include the following:

Communications Access

- Telenet public dial service (public dial facilities in most major U.S. cities)
- Telenet private dial service (dedicated dial port for high-volume users)
- Telenet WATS service (for users in locations with no public dial facilities)
- Tymnet public dial service

Hours of Operation

- BRS/Search Service, **BRS/Colleague:** 6 a.m. to 4 a.m., Eastern Standard Time (EST) Monday through Friday; 6 a.m. to 2 a.m. EST on Saturday; 9 a.m. to 4 a.m. EST on Sunday
- **BRS/After Dark:** 6 p.m. local time to 4 a.m., Monday through Friday EST; 6 a.m. to 4 a.m. EST on Saturday; 9 a.m. to 4 a.m. EST on Sunday

Terminal Requirements

- Any teletype-compatible terminal (print or video).

Off-Line Services

- Users can request off-line printouts from all databases, with the special option of sorting output alphabetically by author, journal title, or other standard bibliographic elements. Printoffs are generated by a laser printer. All off-line printouts are processed the same day requested and mailed to the user first class the following day.

ON-LINE DATABASES

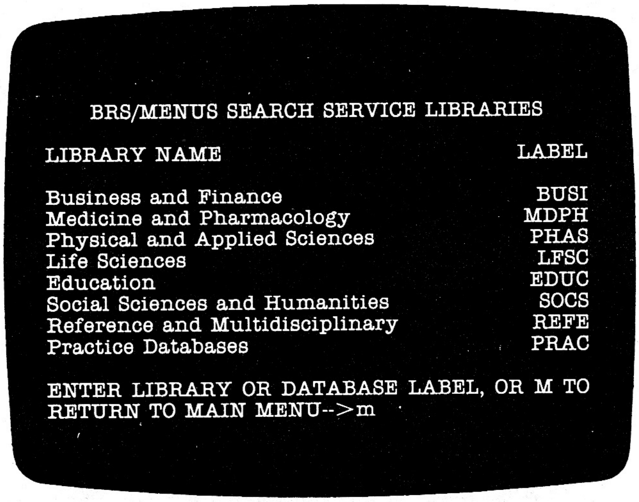
The databases currently available via BRS provide on-line coverage in all major subjects, including the *MEDLINE* database from the National Library of Medicine. BRS selected its databases for their quality and wide appeal; they have been carefully structured for maximum searching efficiency:

- All subject fields, including abstracts, are directly searchable.
- All bibliographic fields, such as languages and publication dates, have been standardized across all BRS databases.
- Many full-text databases can print only those sections of the document relating to the user's query, via the HITS command.

In addition to the larger indexing and abstracting service databases, BRS is also expanding its coverage to provide on-line access to many of the standard library reference tools.

Unique Databases. A unique BRS-produced database, *FILE*, is the "database of databases." *BRS/FILE* is a compilation of facts about databases such as producer, intended audience, and subject coverage for all publicly available BRS databases, thus providing a means to compare databases and make informed database choices. BRS also provides a special CROS database, which is a combined index to its publicly available files. By entering a search in CROS, users can determine the number of citations the strategy would retrieve on all the BRS files.

Table 4 lists and categorizes the databases currently available from BRS (as of July 1989).



```
BRS/MENUS SEARCH SERVICE LIBRARIES

LIBRARY NAME                                  LABEL

Business and Finance                           BUSI
Medicine and Pharmacology                      MDPH
Physical and Applied Sciences                  PHAS
Life Sciences                                  LFSC
Education                                      EDUC
Social Sciences and Humanities                 SOCS
Reference and Multidisciplinary                REFE
Practice Databases                             PRAC

ENTER LIBRARY OR DATABASE LABEL, OR M TO
RETURN TO MAIN MENU-->m
```

Figure 4. BRS/Menus groups databases into libraries and otherwise eliminates the need for users to know anything about the databases that are available.

OTHER SERVICES

Selective Dissemination of Information

BRS offers a total SDI service that enables users to automatically receive a printout of new information relating to their areas of interest as it is added to the BRS databases each month.

Users can have search profiles stored at BRS by simply entering the SDI command at the completion of the online profile. The expiration date for the profile can be specified upon entry, and profiles can be canceled on-line at any time. There are no restrictions on the number of terms included in the profile, and SDIs can be run against many of the BRS databases.

Since it is frequently necessary to change a stored SDI profile to reflect new terminology or modify the monthly number of citations it returns, BRS provides a unique online editing facility. Users can call up a stored SDI profile at any time and easily modify it. Most importantly, users can call up the stored SDI profile and make editing changes without having to rerun the profile.

For current SDI pricing, see Table 2. For more details or questions, contact BRS customer service (800) 345-4277.

BRS OnSite

BRS OnSite uses the same retrieval software running the *BRS/Search Service*, but with *BRS OnSite* the advantage is exactly what the name implies, local handling of information on a customer's in-house mainframe or minicomputer configuration. The result: unlimited access at a fixed and affordable price.

PRIVATE DATABASE SERVICES

In addition to the standard BRS on-line search system for large, commercially available databases, BRS offers a comprehensive private database service called *BRS/PDS.*

PDS can be used in any environment—academic, industrial, governmental—by any organization with a need to maintain its own internal databases on-line. PDS can be used to build an information file "from scratch" or convert an existing machine-readable file to be searched and updated on-line.

PDS was developed specifically for creating, collecting, storing, searching, and maintaining private databases. Using PDS, the user can build a private file of information, search the file on-line, update the file as often as necessary, and even provide printed information products.

BRS will assist in all phases of file development, including initial design, abstracting and indexing of documents, data collection, and user training.

On-Line Catalog Service

BRS offers an on-line catalog service to the library community. Under this special program, BRS will create a private database of catalog records designed to meet an organization's unique needs and searchable using the BRS retrieval software.

All elements of the client's catalog records are directly searchable on BRS, permitting flexible *subject* searching of the catalog, in addition to traditional author/title search keys, LC card numbers, etc. Enhanced subject searching capability for catalog records is ideal for libraries planning eventual on-line public availability.

Using the client's catalog records, BRS will build a database that is structured for searching and printing according to specifications. The database will be stored on the BRS computer and updated according to a prearranged schedule. The client's on-line catalog can be searched using standard dial-up terminals or through special leased-line arrangements. Tapes, COM, and printed bookform catalogs can be produced from the database.

FUTURE PLANS

The new alliance between ORBIT and BRS creates a source for on-line scientific, technical, and medical information. Each service brings databases and industry knowledge to the marketplace. The information sources from Macmillan and other Maxwell companies, along with their technical and financial resources, result in unmatched potential for bringing exciting developments to the on-line community. The company says it is committed to maintaining and developing the highest quality on-line service possible at a reasonable cost.

BRS Information Technologies

TABLE 4. BRS ON-LINE SEARCH PRICING (July 1989)

Database	Label	On-line Connect Cost per Hr Advance Purchase Plan‡	Document Charges•			
			On-line			
			Title	BIBL (F3)	Maximum Charge (F5)	Off-Line
ABI/INFORM	INFO	$80.00	0.00	0.80	0.80	0.77
ABI/INFORM PRACTICE*	INFT	8.00	0.00	0.00	0.00	NA
ABLEDATA	ABLE	50.00	0.00 *BN*	0.30	0.30	0.25
ABSTRACTS OF WORKING PAPERS IN ECONOMICS*	AWPE	55.00	0.00	0.00	0.35	0.25
ACADEMIC AMERICAN ENCYCLOPEDIA DATABASE • *	AAED	45.00	0.00	0.00	0.37	0.57
ACADEMIC INDEX	ACAD	93.00	0.00	0.20	0.20	0.25
AGELINE*	AARP	50.00	0.00	0.35	0.35	0.30
AGRICOLA AND BACKFILE*	CAIN,CAIB	29.00	0.00	0.17	0.17	0.12
AIDS ABSTRACTS FROM THE BUREAU OF HYGIENE & TROPICAL DISEASES	AIDD	60.00	0.00	0.65	0.65	0.60
AIDS ARTICLES FROM THE COMPREHENSIVE CORE MEDICAL LIBRARY •	AACC	45.00	0.00	0.90	0.90	0.85
AIDS KNOWLEDGE BASE •	ASFG	70.00	0.00	0.00	0.60	0.00-0.55[1]
ALCOHOL & ALCOHOL PROBLEMS SCIENCE	ETOH	45.00	0.00	0.45	0.45	0.10-0.40
ALCOHOL INFORMATION FOR CLINICIANS AND EDUCATORS	CORK	45.00	0.00	0.30	0.30	0.30
ARTS & HUMANITIES SEARCH • * —SUBSCRIBER[3]	AHCI	42.50	0.00	0.37	0.42	0.32-0.37
—NONSUBSCRIBER		85.00	0.00	0.37	0.42	0.32-0.37
ARTS & HUMANITIES SEARCH PRACTICE • *	AHCT	8.00[11]	0.00	0.00	0.00	NA
BIOBUSINESS	BBUS	90.00	0.00	0.38	0.38	0.18-0.35
BIOSIS PREVIEWS AND BACKFILE*	BIOL,BIOB	75.00	0.00	0.25	0.41	0.21-0.38
BIOSIS PREVIEWS (MERGED)*	BIOZ	77.00	0.00	0.25	0.41	0.21-0.38
BOOKS IN PRINT*	BBIP	65.00	0.00	0.15	0.15	0.20
BOWKER'S INTERNATIONAL SERIALS DATABASE*	ULRI	65.00	0.00	0.15	0.15	0.20
BRS/ACCOUNTING FILE*	ACCT	25.00	NA	NA	NA	NA
BRS/CROS*	CROS	25.00	NA	NA	NA	NA
BRS/FILE*	FILE	25.00	0.00*DL*	0.00	0.00	0.00
BRS/MESSAGE SWITCHING*	MSGS	25.00	NA	NA	NA	NA
BRS/NEWS*	NEWS	25.00	NA	NA	NA	NA
BUSINESS DATELINE •	BDLN	90.00	0.00	0.50	3.50	0.50-3.50
BUSINESS SOFTWARE DATABASE*	BSOF	70.00	0.00*SN*	0.75	0.75	0.20-0.65
CA SEARCH AND BACKFILE	CHEM,CHEB	98.00	0.52	0.68	0.68	0.24-0.62
CA SEARCH PRACTICE*	CAST	8.00[11]	0.00	0.00	0.00	NA
CAB ABSTRACTS*	CABA	54.00	0.00	0.39	0.39	0.07-0.34
CAB—ECONOMICS, DEVELOPMENT, AND EDUCATION	ECON	54.00	0.00	0.39	0.39	0.07-0.34
CAB—HUMAN NUTRITION	NUTR	54.00	0.00	0.39	0.39	0.07-0.34
CAB—TOURISM, LEISURE & RECREATION	TOUR	54.00	0.00	0.39	0.39	0.07-0.34
CAB—VETERINARY AND MEDICAL	VETR	54.00	0.00	0.39	0.39	0.07-0.34
CAMBRIDGE SCIENTIFIC ABSTRACTS ENGINEERING *	CSEN	54.00	0.00	0.50	0.50	0.10-0.45
CANCERLIT*	CANR	25.00	0.00	0.15	0.15	0.11
COMBINED HEALTH INFORMATION DATABASE • *	CHID	35.00	0.00	0.31	0.31	0.21-0.36
COMPENDEX*	COMP	80.00	0.41	0.46	0.46	0.41
COMPREHENSIVE CORE MEDICAL LIBRARY •	CCML	45.00	0.00	0.90	0.90	0.85
CCML JOURNAL SUBSET •	JOUR	45.00	0.00	0.90	0.90	0.85
CCML BOOK SUBSET •	MEDB	45.00	0.00	0.90	0.90	0.85
COMPUTER & MATHEMATICS SEARCH • * —SUBSCRIBER[3]	CMCI	50.00	0.00	0.36	0.41	0.31-0.36
—NONSUBSCRIBER		90.00	0.00	0.36	0.41	0.31-0.36
COMPUTER DATABASE*	CMPT	90.00	0.00	0.55	0.55	0.50
CONGRESSIONAL RECORD ABSTRACTS*	CREC	70.00	0.30*AB*	0.30	0.30	0.25
CONSUMER DRUG INFORMATION DATABASE • *	CDIF	35.00	0.60	0.60	0.97	1.22
CORPORATE AND INDUSTRY RESEARCH REPORTS ONLINE INDEX*	CIRR	57.00	0.94	0.94	0.94	0.89
CURRENT CONTENTS SEARCH •	CCON	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
ARTS & HUMANITIES •	ARTS	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
CLINICAL MEDICINE •	CLIN	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
LIFE SCIENCES •	LIFE	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
AGRICULTURE, BIOLOGY & ENVIRONMENTAL SCIENCES •	AGRI	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
ENGINEERING, TECHNOLOGY & APPLIED SCIENCES •	ENGI	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
PHYSICAL, CHEMICAL & EARTH SCIENCES •	PHYS	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
SOCIAL & BEHAVIORAL SCIENCES •	BEHA	75.00	NA	0.00	1.01[10]	0.00-0.96[10]
DIOGENES •	DIOG	105.00	0.00	0.50	1.80	1.41[2]
DISCLOSURE/HEALTH • *	DSHL	45.00	1.84*CO*	0.72	13.00[8]	0.00-15.00[8]
DISCLOSURE/HISTORY • *	DSCH	45.00	1.84*CO*	0.72	7.37[8]	0.00-8.35[8]
DISCLOSURE ONLINE • *	DSCL	45.00	1.84*CO*	0.72	13.00[8]	0.00-15.00[8]

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○ *Document charges are based on the fields printed. These figures indicate the range of charges for both on-line and off-line printing. Detailed document charges are available on-line in BRS/FILE.*

‡ This represents the Open Access Plan which is the highest possible rate. Advance Purchase and Monthly Installment subscribers, subtract your hourly discount from the figure in this column to calculate your hourly rate.

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TABLE 4. BRS ON-LINE SEARCH PRICING (July 1989) (Continued)

			Document Charges•			
			On-line			
Database	**Label**	**On-line Connect Cost per Hr Advance Purchase Plan‡**	**Title**	**BIBL (F3)**	**Maximum Charge (F5)**	**Off-Line**
DISCLOSURE/SPECTRUMOWNERSHIP • *	OWNR	60.00	0.42*CO*	0.93	28.00[8]	0.00-33.00[8]
DISSERTATION ABSTRACTS ONLINE*	DISS	65.00	0.00	0.26	0.26	0.21
DRUGINFO/ALCOHOL USE-ABUSE (MERGED)*	DRUG	45.00	0.00	0.35	0.35	0.35
DRUGINFO*	DRSC	45.00	0.00	0.35	0.35	0.35
ALCOHOL USE-ABUSE*	HAZE	45.00	0.00	0.35	0.35	0.35
DRUG INFORMATION FULLTEXT • *	DIFT	35.00	0.00	0.00	1.60	0.38[2]
EDUCATIONAL TESTING SERVICE TEST COLLECTION*	ETSF	50.00	0.65	0.65	0.65	0.10-0.60
ELECTRONIC MATERIALS INFORMATION SYSTEM	EMIS	54.00	0.00	6.80[9]	6.80[9]	0.00-6.80[9]
EMBASE (MERGED)	EMEZ	82.00	0.00	0.58	0.58	0.22-0.43
EMBASE AND BACKFILE*	EMED,EMEB	80.00	0.00	0.58	0.58	0.22-0.43
EMBASE DRUG INFORMATION	EMDR	80.00	0.00	0.58	0.58	0.22-0.43
EMBASE PRACTICE*	EMET	8.00[11]	0.00	0.00	0.00	NA
ERIC*	ERIC	31.00	0.00	0.15	0.15	0.10
EXCEPTIONAL CHILD EDUCATION RESOURCES*	ECER	45.00	0.05	0.20	0.20	0.17
FAIRBASE	FAIR	105.00	0.90	0.90	0.90	0.85
FAMILY RESOURCES*	NCFR	50.00	0.00	0.35	0.35	0.25
FEDERAL & STATE BUSINESS ASSISTANCE*	FSBA	50.00	0.00	0.30	0.30	0.10-0.20
FEDERAL APPLIED TECHNOLOGY DATABASE*	FATD	50.00	0.00	0.30	0.30	0.10-0.20
FEDERAL REGISTER ABSTRACTS*	FREG	70.00	0.30*AB*	0.30	0.30	0.25
FINIS: FINANCIAL INDUSTRY INFORMATION SERVICE*	FINI	65.00	0.00	0.48	0.48	0.40
GPO MONTHLY CATALOG*	GPOM	25.00	0.00	0.15	0.15	0.10
HARVARD BUSINESS REVIEW/ONLINE • *	HBRO	80.00	0.00	0.37	0.37	0.55[2]
HAZARDLINE • *	HZDB	115.00	0.00*CN*	0.37	0.37	0.32
HEALTH INDUSTRY RESEARCH REPORTS	HIRR	57.00	0.94	0.94	0.94	0.89
HEALTH INSTRUMENT FILE	HIFF	45.00	0.00	0.40	0.40	0.10-0.35
HEALTH PLANNING & ADMINISTRATION*[5]	HLTH	25.00	0.00	0.14	0.14	0.11
HUD USER*	HUDU	30.00	0.21	0.21	0.21	0.20
IHS VENDOR INFORMATION •	VEND	70.00	0.26*CO*	0.26	0.26	0.41
INDEX TO U.S. GOVERNMENT PERIODICALS	GOVT	55.00	1.00	1.00	1.00	1.10
INDUSTRY AND INTERNATIONAL STANDARDS	STDS	55.00	0.00	0.26	0.26	0.31
INDUSTRY STANDARDS AND MILITARY SPECIFICATIONS (MERGED)	ISMS	65.00	0.00	0.26	0.26	0.31
INSPEC AND BACKFILE*	INSP,INSB	90.00	0.00	0.57	0.57	0.54
INSPEC (MERGED FILE)*	INSZ	92.00	0.00	0.57	0.57	0.54
INTEGRATED CIRCUIT PARAMETER RETRIEVAL	ICPR	85.00	0.25*CO*	0.25	0.25	0.30
INTERNATIONAL PHARMACEUTICAL ABSTRACTS*	IPAB	45.00	0.30	0.45	0.45	0.45
INTERNATIONAL REVIEW OF PUBLICATIONS IN SOCIOLOGY	IRPS	53.00	0.00	0.31	0.31	0.31
INVESTEXT •	INVT	102.00	0.00	0.25	0.25[7]	0.00-0.25[7]
INVESTORS DAILY	IVDA	55.00	0.00	0.00	1.00	0.95
JOURNAL WATCH	JWAT	45.00	0.00*HL*	0.37	0.37	0.32
KIRK-OTHMER ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY • *	KIRK	80.00	0.00	0.00	0.37	0.55[2]
KNOWLEDGE INDUSTRY PUBLICATIONS DATABASE*	KIPD	50.00	0.00*DB*	0.40	0.40	0.35
LEGAL RESOURCE INDEX*	LAWS	98.00	0.00	0.20	0.20	0.25
LINGUISTICS & LANGUAGE BEHAVIOR ABSTRACTS*	LLBA	53.00	0.00	0.31	0.31	0.31
MAGAZINE INDEX*	MAGS	93.00	0.00	0.20	1.20[6]	0.25-2.25[6]
MAGAZINE ASAP III • *	MSAP	98.00	0.00	0.00	1.00	0.00-2.00
MANAGEMENT CONTENTS AND BACKFILE*	MGMT,MGMB	70.00	0.00	0.45	0.45	0.40
MATHSCI*	MATH	55.00	0.13	0.33	0.38	0.34-0.39
MEDICAL & PSYCHOLOGICAL PREVIEWS*	PREV	50.00	0.00	0.21	0.21	0.16
MEDICAL SCIENCE RESEARCH DATABASE •	IRCS	45.00	0.00	0.37	0.87	0.73[2]
MEDLINE AND BACKFILES*[5]	MESH,MESB MS82,MS76 MS71	25.00	0.00	0.14	0.14	0.11
MEDLINE (MERGED)*[5]	MESZ	27.00	0.00	0.14	0.14	0.11
MEDLINE REFERENCES ON AIDS[5]	MRAI	25.00	0.00	0.14	0.14	0.11
MENTAL MEASUREMENTS YEARBOOK • *	MMYD	55.00	0.00*TN*	0.37	0.37	0.50[2]
MERCK INDEX*	MRCK	45.00	0.00	0.22	0.22	0.39

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TABLE 4. BRS ON-LINE SEARCH PRICING (July 1989) (Continued)

Database	Label	On-line Connect Cost per Hr Advance Purchase Plan‡	Document Charges•			
			On-line			
			Title	BIBL (F3)	Maximum Charge (F5)	Off-Line
MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS	MLSS	55.00	0.00	0.26	0.26	0.31
NATIONAL COLLEGE DATABANK • *	PETE	45.00	0.05*CN*	0.65	0.65	0.15-0.60
NATIONAL ENVIRONMENTAL DATA REFERRAL SERVICE*	NEDS	40.00	0.05	0.20	0.20	0.25
NATIONAL NEWSPAPER INDEX*	NOOZ	93.00	0.00	0.20	0.20	0.25
NEWS ENGLAND JOURNAL OF MEDICINE •	NEJM	45.00	0.00	0.90	0.90	0.85
NEWSEARCH*	DALY	123.00	0.00	0.20	0.20	0.30
NTIS BIBLIOGRAPHIC DATABASE*	NTIS	55.00	0.00	0.42	0.42	0.37
NURSING & ALLIED HEALTH*	NAHL	45.00	0.00	0.26	0.26	0.25
OCLC EASI REFERENCE*—MEMBER[4]	OCLC	35.00	0.15	0.15	0.15	0.10
—NONMEMBER		65.00	0.23	0.23	0.23	0.18
ONTARIO EDUCATION RESOURCES INFORMATION*	ONED	30.00	0.05	0.20	0.20	0.15
PAIS INTERNATIONAL*	PAIS	60.00	0.00	0.35	0.35	0.15-0.35
PATDATA*	PATS	65.00	0.04	0.20	0.20	0.11
PDQ: CANCER INFORMATION •	PDQC	45.00	0.00*CN*	0.00	0.20	0.15
PDQ: DIRECTORY •	PDQD	45.00	NA	0.20	0.20	0.15
PDQ: PATIENT INFORMATION •	PDQI	45.00	0.00*CN*	0.20	0.20	0.15
PDQ: PROTOCOLS •	PDQP	45.00	0.00*PN*	0.20	0.20	0.15
PHARMACEUTICAL NEWS INDEX	PNII	110.00	0.00	0.55	0.55	0.10-0.50
POLLUTION ABSTRACTS*	POLL	60.00	0.25	0.42	0.42	0.37
POPULAR MAGAZINE REVIEW ONLINE*	PMRO	70.00	0.00	0.65	0.65	0.60
PRACTICE COMPLETE TEXT JOURNALS • *	PCTJ	8.00[11]	0.00	0.00	0.00	NA
PRACTICE MEDLINE*	PMED	8.00[11]	0.00	0.00	0.00	NA
PTS/F&S AND PTS/PROMT (MERGED)*	PTSL	110.00	0.00	0.37	0.67	0.32-0.62
PTS/F&S INDEX*	PTSI	105.00	0.00	0.37	0.37	0.32
PTS/PROMT*	PTSP	110.00	0.00	0.67	0.67	0.62
PSYCALERT	PSAL	47.00	0.00	0.15	0.15	0.13
PSYCINFO*	PSYC	50.00	0.00	0.30	0.45	0.125-0.15
REHABDATA*	NRIC	50.00	0.00	0.30	0.30	0.25
RELIGION DATABASE*	RELI	40.00	0.00	0.15	0.15	0.15
RESOURCES IN VOCATIONAL EDUCATION*	RIVE	25.00	0.00	0.00	0.15	0.10
SCIENCE •	SCIE	45.00	0.00	0.90	0.90	0.85
SCIENTIFIC AMERICAN MEDICINE •	SAMM	45.00	0.00	0.00	0.90	0.65[2]
SEMICONDUCTOR PARAMETER RETRIEVAL	SCPR	85.00	0.25	0.25	0.25	0.30
SOCIAL PLANNING/POLICY & DEVELOPMENT ABSTRACTS	SPDA	53.00	0.00	0.31	0.31	0.31
SOCIAL SCISEARCH*—subscriber[3]	SSCI	52.00	0.00	0.37	0.42	0.32-0.37
—nonsubscriber		107.00	0.00	0.37	0.42	0.32-0.37
SOCIAL SCISEARCH PRACTICE *	SSCP	8.00[11]	0.00	0.00	0.00	NA
SOCIAL WORK ABSTRACTS*	SWAB	65.00	0.20	0.20	0.20	0.35
SOCIOLOGICAL ABSTS & SOC. PLANNING/POLICY & DEV. ABSTS/ INT'L REV. OF PUBS. IN SOC. (MERGED) *	SOCZ	55.00	0.00	0.31	0.31	0.31
SOCIOLOGICAL ABSTRACTS *	SOCA	53.00	0.00	0.31	0.31	0.31
SOFT: ONLINE MICROCOMPUTER SOFTWARE GUIDE AND DIRECTORY • *	SOFT	65.00	0.00 *SN	0.99	0.99	0.74
SPORT DATABASE*	SFDB	75.00	0.00	0.35	0.41	0.28-0.34
SPORT & FITNESS THESAURUS*	SFTH	70.00	0.00	0.00	0.00	0.25
TOXLINE[5]	TOXL	25.00	0.00	0.14	0.14	0.11
TOXLINE SUBSET[5]	XTOL	25.00	0.00	0.14	0.14	0.11
TRADE AND INDUSTRY ASAP III • *	TSAP	98.00	0.00	0.00	1.00	0.00-2.00
UMI ARTICLE CLEARINGHOUSE*	UMAC	40.00	0.00	0.00	0.00	0.00
VOCATIONAL EDUCATION CURRICULUM	VECM	25.00	0.00	0.00	0.15	0.10
ZOOLOGICAL RECORD	ZREC	60.00	0.00	0.36	0.36	0.17-0.33

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BRS Information Technologies

TABLE 5. BRS DATABASES BY SUBJECT AREA

DATABASE	LABEL
Life Sciences	
AGRICOLA AND BACKFILE	CAIN CAIB
AIDS ABSTRACTS FROM THE BUREAU OF HYGIENE AND TROPICAL DISEASES	AIDD
AIDS ARTICLES FROM THE COMPREHENSIVE CORE MEDICAL LIBRARY	AACC
BIOBUSINESS	BBUS
BIOSIS PREVIEWS, BACKFILE AND MERGED FILE	BIOL BIOB BIOZ
CAB ABSTRACTS	CABA
CAB—VETERINARY AND MEDICAL	VETR
CURRENT CONTENTS: AGRICULTURE, BIOLOGY AND ENVIRONMENTAL SCIENCES	AGRI
CURRENT CONTENTS: LIFE SCIENCES	LIFE
DISSERTATION ABSTRACTS ONLINE	DISS
FAIRBASE	FAIR
MERCK INDEX	MRCK
NATIONAL ENVIRONMENTAL DATA REFERRAL SERVICE	NEDS
NTIS BIBLIOGRAPHIC DATABASE	NTIS
POLLUTION ABSTRACTS	POLL
SCIENCE	SCIE
TOXLINE	TOXL
TOXLINE SUBSET	XTOL
ZOOLOGICAL RECORD	ZREC
Medicine/Pharmacology	
AGELINE	AARP
AIDS ARTICLES FROM THE COMPREHENSIVE CORE MEDICAL LIBRARY	AACC
AIDS ABSTRACTS FROM THE BUREAU OF HYGIENE AND TROPICAL DISEASES	AIDD
AIDS KNOWLEDGE BASE FROM SAN FRANCISCO GENERAL HOSPITAL	ASFG
ALCOHOL INFORMATION FOR CLINICIANS AND EDUCATORS	CORK
ALCOHOL & ALCOHOL PROBLEMS SCIENCE	ETOH
BIOSIS PREVIEWS, BACKFILE, AND MERGED FILES	BIOL BIOB BIOZ
CAB ABSTRACTS	CABA
CAB—HUMAN NUTRITION	NUTR
CANCERLIT	CANR
CCML JOURNAL SUBSET	JOUR
CCML—TEXTBOOK SUBSET	MEDB
CA SEARCH AND BACKFILE	CHEM CHEB
COMBINED HEALTH INFORMATION DATABASE	CHID
COMPREHENSIVE CORE MEDICAL LIBRARY	CCML
CONSUMER DRUG INFORMATION DATABASE	CDIF
CURRENT CONTENTS SEARCH	CCON
CURRENT CONTENTS: CLINICAL MEDICINE	CLIN
DIOGENES	DIOG
DISSERTATION ABSTRACTS ONLINE	DISS
DRUG INFORMATION FULLTEXT	DIFT
EMBASE (MERGED)	EMEZ
EMBASE AND BACKFILE	EMED EMEB
EMBASE DRUG INFORMATION	EMDR
HAZARDLINE	HZDB
HEALTH INSTRUMENT FILE	HIFF
HEALTH PLANNING AND ADMINISTRATION	HLTH
INTERNATIONAL PHARMACEUTICAL ABSTRACTS	IPAB
JOURNAL WATCH	JWAT
MEDICAL AND PSYCHOLOGICAL PREVIEWS	PREV
MEDICAL SCIENCE RESEARCH DATABASE	IRCS
MEDLINE 1983-Present	MESH
MEDLINE—BACKFILES (1977-1982)	MS82
(1972-1976)	MS76
(1966-1971)	MS71
(1966-1982)	MESB
MEDLINE (MERGED)	MESZ
MEDLINE REFERENCES ON AIDS	MRAI
MERCK INDEX	MRCK
NEW ENGLAND JOURNAL OF MEDICINE	NEJM
NURSING & ALLIED HEALTH DATABASE	NAHL
PDQ CANCER INFORMATION FILE	PDQC
PDQ DIRECTORY FILE	PDQD
PDQ PATIENT INFORMATION FILE	PDQI
PDQ PROTOCOL FILE	PDQP
PHARMACEUTICAL NEWS INDEX	PNII
PSYCALERT	PSAL
PSYCINFO	PSYC
SCIENTIFIC AMERICAN MEDICINE	SAMM
SPORT DATABASE	SFDB
SPORT & FITNESS THESAURUS	SFTH
Physical/Applied Sciences	
BUSINESS SOFTWARE DATABASE	BSOF
CAMBRIDGE SCIENTIFIC ABSTRACTS ENGINEERING	CSEN
COMPENDEX	COMP
COMPUTER DATABASE	CMPT
COMPUTER & MATHEMATICS SEARCH	CMCI
CURRENT CONTENTS: ENGINEERING, TECHNOLOGY & APPLIED SCIENCES	ENGI
CURRENT CONTENTS: PHYSICAL, CHEMICAL & EARTH SCIENCES	PHYS
DISSERTATION ABSTRACTS ONLINE	DISS
ELECTRONIC MATERIALS INFORMATION	EMIS
FAIRBASE	FAIR
HAZARDLINE	HZDB
IHS VENDOR INFORMATION	VEND
INDUSTRY AND INTERNATIONAL STANDARDS	STDS
INDUSTRIAL STANDARDS AND MILITARY SPECIFICATIONS (MERGED)	ISMS
INSPEC, BACKFILE AND MERGED	INSP INSB INSZ
INTEGRATED CIRCUIT PARAMETER RETRIEVAL DATABASE	ICPR
KIRK—OTHMER ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY	KIRK
MATH/SCI	MATH
MERCK INDEX	MRCK
MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS	MLSS
NATIONAL ENVIRONMENTAL DATA REFERRAL SERVICE	NEDS
NTIS BIBLIOGRAPHIC DATABASE	NTIS
PATDATA	PATS
SCIENCE	SCIE
SEMICONDUCTOR PARAMETER RETRIEVAL	SCPR
SOFT: ONLINE MICROCOMPUTER SOFTWARE GUIDE AND DIRECTORY	SOFT
Business	
ABI/INFORM	INFO
ABSTRACTS OF WORKING PAPERS IN ECONOMICS	AWPE
BIOBUSINESS	BBUS
BUSINESS DATELINE	BDLN
BUSINESS SOFTWARE DATABASE	BSOF
CAB—ECONOMICS, DEVELOPMENT AND EDUCATION	ECON
CAB—LEISURE, RECREATION AND TOURISM	TOUR
CORPORATE AND INDUSTRY RESEARCH REPORTS ONLINE INDEX	CIRR
DISCLOSURE/HEALTH	DSHL
DISCLOSURE/HISTORY DATABASE	DSCH
DISCLOSURE ONLINE DATABASE	DSCL
DISCLOSURE/SPECTRUM OWNERSHIP DATABASE	OWNR
DISSERTATION ABSTRACTS ONLINE	DISS
FEDERAL AND STATE ASSISTANCE FOR BUSINESS	FSBA
FEDERAL APPLIED TECHNOLOGY DATABASE	FATD
FEDERAL REGISTER ABSTRACTS	FREG
FINIS: FINANCIAL INDUSTRY INFORMATION	FINI
HARVARD BUSINESS REVIEW/ONLINE	HBRO
HEALTH INDUSTRY RESEARCH REPORTS	HIRR
INVESTEXT	INVT
INVESTORS DAILY	IVDA
MANAGEMENT CONTENTS AND BACKFILE	MGMT MGMB
PATDATA	PATS
PTS/F&S INDEXES	PTSI
PTS/PROMPT	PTSP
PTS/F&S AND PTS/PROMPT (MERGED)	PTSL
TRADE AND INDUSTRY ASAP III	TSAP
Social Sciences/Humanities	
ABLEDATA	ABLE
ABSTRACTS OF WORKING PAPERS IN ECONOMICS	AWPE
AGELINE	AARP
ALCOHOL USE AND ABUSE	HAZE
ARTS & HUMANITIES SEARCH	AHCI
CURRENT CONTENTS: ARTS & HUMANITIES	ARTS
CURRENT CONTENTS: SOCIAL & BEHAVIORAL SCIENCES	BEHA
CONGRESSIONAL RECORD ABSTRACTS	CREC
DISSERTATION ABSTRACTS ONLINE	DISS
DRUGINFO	DRSC
DRUGINFO/ALCOHOL USE AND ABUSE (MERGED)	DRUG
FAMILY RESOURCES	NCFR
HUD USER	HUDU
INTERNATIONAL REVIEW OF PUBLICATIONS IN SOCIOLOGY	IRPS
LEGAL RESOURCE INDEX	LAWS
LINGUISTICS AND LANGUAGE BEHAVIOR ABSTRACTS	LLBA
MENTAL MEASUREMENTS YEARBOOK	MMYD
PAIS INTERNATIONAL	PAIS
PSYCALERT	PSAL
PSYCINFO	PSYC
REHABDATA	NRIC
RELIGION DATABASE	RELI
SOCIAL PLANNING/POLICY AND DEVELOPMENT ABSTRACTS	SPDA
SOCIAL SCISEARCH BACKFILE AND MERGED FILE	SSCI
SOCIAL WORK ABSTRACTS	SWAB
SOCIOLOGICAL ABSTRACTS	SOCA
SOCA, SPDA & IRPS (MERGED)	SOCZ
SOCIOLOGICAL ABSTRACTS & SOCIAL PLANNING/POLICY AND DEVELOPMENT ABSTRACTS (MERGED)	
SPORT DATABASE	SFDB
SPORT & FITNESS THESAURUS	SFTH
Education	
AGELINE	AARP
DISSERTATION ABSTRACTS ONLINE	DISS
EDUCATIONAL TESTING SERVICE TEST COLLECTION	ETSF
ERIC	ERIC
EXCEPTIONAL CHILD EDUCATION RESOURCES	ECER
MENTAL MEASUREMENTS YEARBOOK	MMYD
NATIONAL COLLEGE DATABANK	PETE
ONTARIO EDUCATION RESOURCES INFORMATION SYSTEM	ONED
RESOURCES IN VOCATIONAL EDUCATION	RIVE
SPORT DATABASE	SFDB
SPORT & FITNESS THESAURUS	SFTH
VOCATIONAL EDUCATION CURRICULUM MATERIALS	VECM

TABLE 5. BRS DATABASES BY SUBJECT AREA (Continued)

DATABASE	LABEL	DATABASE	LABEL	DATABASE	LABEL
Reference/Multidisciplinary		INDEX TO U.S. GOVERNMENT PERIODICALS	GOVT	**Practice Databases**	
ACADEMIC AMERICAN ENCYCLOPEDIA DATABASE	AAED	KNOWLEDGE INDUSTRY PUBLICATIONS DATABASE	KIPD	ARTS & HUMANITIES SEARCH PRACTICE	AHCT
ACADEMIC INDEX	ACAD	LEGAL RESOURCE INDEX	LAWS	CA SEARCH PRACTICE	CAST
BOOKS IN PRINT	BBIP	MAGAZINE ASAP III	MSAP	EMBASE PRACTICE	EMET
BOWKER'S INTERNATIONAL SERIALS DATABASE	ULRI	MAGAZINE INDEX	MAGS	ABI/INFORM PRACTICE	INFT
BUSINESS SOFTWARE DATABASE	BSOF	MERCK INDEX	MRCK	PRACTICE COMPLETE TEXT JOURNALS	PCTJ
CONGRESSIONAL RECORD ABSTRACTS	CREC	NATIONAL COLLEGE DATABANK	PETE	PRACTICE MEDLINE	PMED
CURRENT CONTENTS SEARCH	CCON	NATIONAL NEWSPAPER INDEX	NOOZ	SOCIAL SCISEARCH PRACTICE	SSCP
FEDERAL REGISTER ABSTRACTS DATABASE	FREG	NEWSEARCH	DALY	**Special BRS Databases**	
FAIRBASE	FAIR	OCLC EASI REFERENCE	OCLC	BRS/ACCOUNTING	ACCT
FEDERAL APPLIED TECHNOLOGY DATABASE	FATD	POPULAR MAGAZINE REVIEW ONLINE	PMRO	BRS/CROS	CROS
GPO MONTHLY CATALOG	GPOM	SOFT: ONLINE MICROCOMPUTER SOFTWARE GUIDE AND DIRECTORY	SOFT	BRS/FILE	FILE
		UMI ARTICLE CLEARINGHOUSE	UMAC	BRS/NEWS	NEWS
				BRS/MESSAGES	MSGS

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BRS Information Technologies

DATABASE	LABEL
Social Sciences/Humanities	
ABLEDATA	ABLE
ABSTRACTS OF WORKING PAPERS IN ECONOMICS	AWPE
AGELINE	AARP
AIDS KNOWLEDGE BASE FROM SAN FRANCISCO GENERAL HOSPITAL	ASFG
ALCOHOL USE AND ABUSE	HAZE
ARTS & HUMANITIES SEARCH™	AHCI
CATALYST RESOURCES ON THE WORKFORCE AND WOMEN	CRFW
CONGRESSIONAL RECORD ABSTRACTS	CREC
DISSERTATION ABSTRACTS ONLINE	DISS
DRUGINFO	DRSC
DRUGINFO/ALCOHOL USE AND ABUSE (MERGED)	DRUG
FAMILY RESOURCES	NCFR
FEDERAL REGISTER ABSTRACTS DATABASE	FREG
HUD USER	HUDU
INTERAGENCY REHABILITATION RESEARCH INFORMATION SYSTEM	IRRI
INTERNATIONAL REVIEW OF PUBLICATIONS IN SOCIOLOGY	IRPS
LEGAL RESOURCE INDEX™	LAWS
LINGUISTICS AND LANGUAGE BEHAVIOR ABSTRACTS	LLBA
MENTAL MEASUREMENTS YEARBOOK	MMYD
PAIS INTERNATIONAL	PAIS
PSYCALERT	PSAL
PSYCINFO	PSYC
REHABDATA	NRIC
RELIGION DATABASE	RELI
SOCIAL PLANNING/POLICY AND DEVELOPMENT ABSTRACTS	SPDA
SOCIAL SCISEARCH® BACKFILE AND MERGED FILE	SSCI SSCB SSCZ

DATABASE	LABEL
SOCIAL WORK ABSTRACTS	SWAB
SOCIOLOGICAL ABSTRACTS	SOCA
SOCIOLOGICAL ABSTRACTS & SOCIAL PLANNING/POLICY AND DEVELOPMENT ABSTRACTS (MERGED)	SOCZ
SPORT DATABASE	SFDB
SPORT & FITNESS THESAURUS	SFTH
WORK/FAMILY LIFE DATABASE	WFLD
Education	
AGELINE	AARP
DISSERTATION ABSTRACTS ONLINE	DISS
EDUCATIONAL TESTING SERVICE TEST COLLECTION	ETSF
ERIC	ERIC
EXCEPTIONAL CHILD EDUCATION RESOURCES	ECER
MENTAL MEASUREMENTS YEARBOOK	MMYD
NATIONAL COLLEGE DATABANK™	PETE
ONTARIO EDUCATION RESOURCES INFORMATION SYSTEM	ONED
RESOURCES IN VOCATIONAL EDUCATION	RIVE
SPORT DATABASE	SFDB
SPORT & FITNESS THESAURUS	SFTH
VOCATIONAL EDUCATION CURRICULUM MATERIALS	VECM
Reference/Multidisciplinary	
ACADEMIC AMERICAN ENCYCLOPEDIA DATABASE	AAED
BOOKS IN PRINT	BBIP
BOWKER'S INTERNATIONAL SERIALS DATABASE	ULRI
BUSINESS SOFTWARE DATABASE	BSOF
CONGRESSIONAL RECORD ABSTRACTS	CREC
CURRENT CONTENTS SEARCH	CCON

DATABASE	LABEL
FEDERAL REGISTER ABSTRACTS DATABASE	FREG
FAIRBASE	FAIR
GPO MONTHLY CATALOG	GPOM
INDEX TO U.S. GOVERNMENT PERIODICALS	GOVT
KNOWLEDGE INDUSTRY PUBLICATIONS DATABASE	KIPD
LEGAL RESOURCE INDEX™	LAWS
MAGAZINE ASAP III™	MSAP
MAGAZINE INDEX™	MAGS
MERCK INDEX	MRCK
NATIONAL COLLEGE DATABANK™	PETE
NATIONAL NEWSPAPER INDEX™	NOOZ
NEWSEARCH	DALY
OCLC EASI REFERENCE	OCLC
ONLINE MICROCOMPUTER SOFTWARE GUIDE AND DIRECTORY	SOFT
POPULAR MAGAZINE REVIEW ONLINE	PMRO
SPORT THESAURUS DATABASE	SFTH
TERM	TERM
UMI ARTICLE CLEARINGHOUSE	UMAC
Practice Databases	
ARTS & HUMANITIES SEARCH PRACTICE	AHCT
CA SEARCH PRACTICE	CAST
EMBASE PRACTICE	EMET
ABI/INFORM PRACTICE	INFT
PRACTICE COMPLETE TEXT JOURNALS	PCTJ
PRACTICE MEDLINE	PMED
Special BRS Databases	
BRS/ACCOUNTING	ACCT
BRS/CROS	CROS
BRS/FILE	FILE
BRS/NEWS	NEWS
BRS/MESSAGES	MSGS

Table 4. BRS databases by subject area. (Continued)

DATABASE NAME	DESCRIPTION
ABI/INFORM	Business
ABI/INFORM PRACTICE	Practice subset of ABI/INFORM
ABLEDATA	Rehabilitation products for the disabled
ABSTRACTS OF WORKING PAPERS IN ECONOMICS	Economics
ACADEMIC AMERICAN ENCYCLOPEDIA DATABASE	Multi-disciplinary encyclopedia
AGELINE	Information on aging
AGRICOLA AND BACKFILE	Agriculture
AIDS ABSTRACTS FROM THE BUREAU OF HYGIENE & TROPICAL DISEASES	AIDS and related retroviruses
AIDS ARTICLES FROM THE COMPREHENSIVE CORE MEDICAL LIBRARY	AIDS subset of CCML journals
AIDS KNOWLEDGE BASE FROM SAN FRANCISCO GENERAL HOSPITAL	AIDS information from San Francisco General Hospital: An Online Textbook
ALCOHOL INFORMATION FOR CLINICIANS AND EDUCATORS	Alcohol & alcoholism issues
ARTS & HUMANITIES SEARCH	Arts and humanities
ARTS & HUMANITIES SEARCH PRACTICE	Practice subset of Arts & Humanities Search
BIOBUSINESS	Business applications of biology and biomedicine
BIOSIS PREVIEWS AND BACKFILE	Biological sciences
BIOSIS PREVIEWS (MERGED)	Biological sciences
BOOKS IN PRINT	U.S. books in print
BOWKER'S INTERNATIONAL SERIALS DATABASE	Directory of periodicals
BRS/ACCOUNTING FILE	Individual BRS password profile
BRS/CROS	Cross-file searching
BRS/FILE	BRS database directory
BRS/MESSAGE SWITCHING	BRS message switching system
BRS/NEWS	BRS update file
BUSINESS DATELINE	Regional business publications
BUSINESS SOFTWARE DATABASE	Micro, minicomputer software products
CA SEARCH AND BACKFILE	Chemistry (left-hand truncation available)
CA SEARCH PRACTICE	Practice subset of CA Search

Table 5. BRS databases as of May 1988.

DATABASE NAME	DESCRIPTION
CAB ABSTRACTS	Agriculture
CAB—ECONOMICS, DEVELOPMENT, AND EDUCATION	Economics development
CAB—HUMAN NUTRITION	Nutrition
CAB—LEISURE, RECREATION AND TOURISM	Tourism, leisure and recreation
CAB—VETERINARY AND MEDICAL	Veterinary medicine; laboratory animals
CANCERLIT	Cancer and cancer therapy
CATALYST RESOURCES ON THE WORKFORCE AND WOMEN	Current information on women and careers
COMBINED HEALTH INFORMATION DATABASE	Health education and patient oriented health care information
COMPENDEX	Engineering
COMPREHENSIVE CORE MEDICAL LIBRARY	Full-text of medical textbooks and journals
CCML JOURNAL SUBSET	The journal subset of CCML
CCML TEXTBOOK SUBSET	The textbook subset of CCML
COMPUTER & MATHEMATICS SEARCH	Computer science and mathematics
COMPUTER DATABASE	Computer hardware, software and services
CONGRESSIONAL RECORD ABSTRACTS	Abstracts to the Congressional Record
CONSUMER DRUG INFORMATION DATABASE	Full-text consumer drug information
CORPORATE AND INDUSTRY RESEARCH REPORTS ONLINE INDEX	Company and industry research reports and presentations
CURRENT CONTENTS SEARCH	Applied sciences, life sciences, agriculture and medicine
CLINICAL MEDICINE	Clinical practice and medicine
LIFE SCIENCES	Life sciences
AGRICULTURE, BIOLOGY & ENVIRONMENTAL SCIENCES	Agriculture, biology, environmental sciences
ENGINEERING, TECHNOLOGY & APPLIED SCIENCES	Engineering, technology & applied sciences
PHYSICAL, CHEMICAL & EARTH SCIENCES	Physical, chemical & earth sciences
DIOGENES	Regulatory information for the health care industry
DISCLOSURE/HEALTH	Subset of DSCL containing health care companies
DISCLOSURE/HISTORY	One year historical financial report data
DISCLOSURE ONLINE	Full-text financial report data for over 10,000 companies
DISCLOSURE/SPECTRUM OWNERSHIP	Corporate and stock ownership information for 5,000 public companies
DISSERTATION ABSTRACTS ONLINE	Multi-disciplinary
DRUGINFO/ALCOHOL USE-ABUSE (MERGED)	Drug abuse and alcoholism
DRUGINFO	Drug abuse
ALCOHOL USE-ABUSE	Alcoholism
DRUG INFORMATION FULLTEXT	Full-text information on current and investigational drugs
EDUCATIONAL TESTING SERVICE TEST COLLECTION	Educational testing materials
ELECTRONIC MATERIALS INFORMATION SYSTEM	Compilation of data for microelectronic and solid-state related materials
EMBASE	Biomedicine and health
EMBASE PRACTICE	Practice subset of EMBASE
ERIC	Education
EXCEPTIONAL CHILD EDUCATION RESOURCES	Exceptional child education
FAIRBASE	Forthcoming trade fairs, conferences and exhibitions
FAMILY RESOURCES	Marriage and family literature
FEDERAL & STATE BUSINESS ASSISTANCE	Federal and state assistance to business
FEDERAL APPLIED TECHNOLOGY DATABASE	Federal technology available for licensing
FEDERAL REGISTER ABSTRACTS DATABASE	Abstracts to the Federal Register
FINIS: FINANCIAL INDUSTRY INFORMATION SERVICE	Financial services industry
GPO MONTHLY CATALOG	Government publications
HARVARD BUSINESS REVIEW/ONLINE	Business and management
HAZARDLINE	Full-text, hazardous substance information
HEALTH INDUSTRY RESEARCH REPORTS	Health industry subset of CIRR
HEALTH PLANNING & ADMINISTRATION	Health economics, administration and planning
HUD USER	Housing and urban development
IHS VENDOR INFORMATION	Vendor product information
INDEX TO U.S. GOVERNMENT PERIODICALS	Indexes of U.S. government periodicals
INDUSTRY AND INTERNATIONAL STANDARDS	Engineering standards
INDUSTRIAL STANDARDS AND MILITARY SPECIFICATIONS (MERGED)	Concatenated industry and military engineering standards
INSPEC AND BACKFILE	Engineering, physics and computer science
INSPEC (MERGED FILE)	Engineering, physics and computer science
INTEGRATED CIRCUIT PARAMETER RETRIEVAL	Integrated circuit data
INTERAGENCY REHABILITATION RESEARCH INFORMATION SYSTEM	Descriptions of research projects involving rehabilitation
INTERNATIONAL PHARMACEUTICAL ABSTRACTS	Pharmaceutical and drug-related information (left-hand truncation available)
INTERNATIONAL REVIEW OF PUBLICATIONS IN SOCIOLOGY	Books in sociology and related disciplines

Table 5. BRS databases as of May 1988. (Continued)

DATABASE NAME	DESCRIPTION
INVESTEXT	Company and industry analysis
INVESTORS DAILY	Investment news stories
JOURNAL WATCH	Medical literature news service
KIRK-OTHMER ENCYCLOPEDIA OF CHEMICAL TECHNOLOGY	Chemical technology and polymer science engineering
KNOWLEDGE INDUSTRY PUBLICATIONS DATABASE	Directory of computerized databases
LEGAL RESOURCE INDEX	Legal reviews, journal
LINGUISTICS & LANGUAGE BEHAVIOR ABSTRACTS	Language and linguistics
MAGAZINE INDEX	General interest magazines
MAGAZINE ASAP	Full-text magazine articles
MANAGEMENT CONTENTS AND BACKFILE	Management, administration and personal issues
MATHSCI	Mathematics, statistics and computer science
MEDICAL & PSYCHOLOGICAL PREVIEWS	Current awareness for medical and psychology journals
MEDICAL SCIENCE RESEARCH DATABASE	Full-text biomedical research
MEDLINE AND BACKFILES	Medicine, nursing, dentistry (left-hand truncation available in all Medline databases and subsets)
MEDLINE (MERGED)	Medicine, nursing, dentistry
MEDLINE REFERENCES ON AIDS	AIDS subset of MESH
MENTAL MEASUREMENTS YEARBOOK	Standardized testing materials
MERCK INDEX	Chemicals, drugs and substances of biological importance
MILITARY AND FEDERAL SPECIFICATIONS AND STANDARDS	Military and federal specifications and standards
NATIONAL COLLEGE DATABANK	College and university profiles
NATIONAL ENVIRONMENTAL DATA REFERRAL SERVICE	Public, private environmental data and sources
NATIONAL NEWSPAPER INDEX	Five major American newspapers
NEWSEARCH	Business, law and general interest magazines updated daily
NTIS BIBLIOGRAPHIC DATABASE	Government reports, all areas
NURSING & ALLIED HEALTH	Nursing and health care
OCLC EASI REFERENCE	OCLC Online Union Catalog subset
ONLINE MICROCOMPUTER SOFTWARE GUIDE AND DIRECTORY	Microcomputer software information
ONTARIO EDUCATION RESOURCES INFORMATION SYSTEM	Educational research, reports, and curriculum guidelines
PAIS INTERNATIONAL	Public policy issues
PATDATA	All patents registered through U.S. Patent and Trademark Office
PHYSICIANS DATA QUERY: CANCER INFORMATION	Prognostic and treatment information on over 85 different cancers
PHYSICIANS DATA QUERY: DIRECTORY	Physicians and organizations devoted to cancer treatment
PHYSICIANS DATA QUERY: PROTOCOLS	Information on active cancer treatment protocols
POLLUTION ABSTRACTS	Pollution
POPULAR MAGAZINE REVIEW ONLINE	Index to popular U.S. magazines
PRACTICE MEDLINE	Practice subset of MEDLINE
PRACTICE COMPLETE TEXT JOURNALS	Practice journal subset of CCML
PREDICASTS ANNUAL REPORTS ABSTRACTS	Company-specific business and economic information
PTS/F&S INDEX	Business and economics
PTS/F&S AND PTS/PROMT (MERGED)	Business and economics
PTS/PROMPT	Business and economics
PSYCALERT	Current psychological literature
PSYCINFO	Psychology (left-hand truncation available)
REHABDATA	Rehabilitation literature
RELIGION DATABASE	Religion
RESOURCES IN VOCATIONAL EDUCATION	Vocational education
SCIENTIFIC AMERICAN MEDICINE	Current Information: Internal Medicine
SEMICONDUCTOR PARAMETER RETRIEVAL	Semiconductor device information
SOCIAL PLANNING/POLICY & DEVELOPMENT ABSTRACTS	Social welfare, policy & development
SOCIAL SCISEARCH	Social sciences
SOCIAL SCISEARCH (MERGED)	Social sciences
SOCIAL WORK ABSTRACTS	Social work, related fields
SOCIOLOGICAL ABSTRACTS	Sociology and related disciplines
SOCIOLOGICAL ABSTRACTS & SOCIAL PLANNING/POLICY & DEVELOPMENT ABSTRACTS (MERGED)	Sociology, social policy and related disciplines
SPORT DATABASE	Sport, fitness, recreation, sports medicine
SPORT & FITNESS THESAURUS	Thesaurus for Sport Database (SFDB)
TERM	Social science thesauri
TRADE AND INDUSTRY ASAP III	Full-text coverage of major industry information
UMI ARTICLE CLEARINGHOUSE	UMI Document delivery information
VOCATIONAL EDUCATION CURRICULUM MATERIALS	Vocational curriculum materials
WORK/FAMILY LIFE DATABASE	Personnel issues
ZOOLOGICAL RECORD	Zoology, including behavior, ecology, genetics

Table 5. BRS databases as of May 1988. (Continued)

Chemical Abstracts Service (CAS)

COMPANY INFORMATION

Chemical Abstracts Service (CAS)
2540 Olentangy River Road
P.O. Box 3012
Columbus, OH 43210
Telephone (614) 421-3600

A division of the American Chemical Society, Chemical Abstracts Service (CAS) provides access to the world's chemical and chemical engineering information. Its best-known product is *Chemical Abstracts (CA)*, dubbed the "Key to the World's Chemical Literature." The print version of CA forms the basis of its on-line information retrieval service—CAS Online, a database with three component files: CAS' *Registry, CA,* and *CAOLD*.

CAS also provides specific information based on user-specified criteria. This may consist of regular reports or a private database accessible only by authorized users. In addition, CAS offers online services through STN International (the Scientific and Technical Information Network). Joining with CAS in this effort are West Germany's Fachinformationszentrum Energie, Physik, Mathematik GmbH (FIZ Karlsruhe) and the Japan Information Center of Science and Technology (JICST).

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On-line Databases 104

Company Background

The American Chemical Society, a not-for-profit scientific and educational institution with 137,000 worldwide members, established Chemical Abstracts Service (CAS) in 1907. Considered the world's chief repository for chemical information, CAS has also built the largest chemical information database. Since its founding, CAS has continuously published *Chemical Abstracts*, a complete record of the world's chemical literature.

CAS was the first abstracting and indexing service for chemical literature in the United States. CAS was also the first such service produced with extensive computer assistance and the first that made its full structure file available for on-line searching. Currently, nearly 1,500 staff members produce a variety of information services geared to scientists, engineers, managers, consultants, librarians, professors, and students.

Researchers can search the CAS chemical database by chemical structure or structural fragment, as well as by chemical trade name, synonym, and CA bibliographic and index information. CAS also provides custom abstracting services, custom database creation, and regular area-of-interest reports. In addition, CAS produces its Chemical Abstracts weekly issues and related indexes, which are now distributed on paper, microfilm, and microfiche.

In 1984, CAS' parent organization, the American Chemical Society, and West Germany's Fachinformationszentrum Energie, Physik, Mathematik GmbH (FIZ Karlsruhe) linked their on-line computer services to form STN International, the Scientific and Technical Information Network. Via a dedicated telecommunications facility, CAS' computers in Columbus and the FIZ computers at Karlsruhe are linked using the same software, so that file access is uniform. This linkage allows European users to access *CAS Online* in Europe, while North American users can access *Physics Briefs* and other European databases directly from the U.S.

In mid-1986, STN International signed an agreement with the Japan Information Center of Science and Technology (JICST), linking JICST's on-line services with those offered by Chemical Abstracts Service and FIZ Karlsruhe. This has enabled Japanese subscribers to tap STN's databases and has made Japanese scientific and technical databases more accessible in Europe and the U.S.

Competitive Position

CAS is the only comprehensive abstracting and indexing service in chemistry outside the Soviet Union. Other U.S. companies (e.g., the Institute for Scientific Information) publish information that overlaps with part of the CAS database. No one, however, offers a service as comprehensive as Chemical Abstracts' *CAS Online* service. CAS is consistently among the top 5 database producers, with its CA Search database ranking among the top 10 in usage.

Although CAS is a nonprofit company, and the indisputable leader in its field, it's an aggressive company. This may reflect the company's finding that electronic versions of its products are, for the first time, about to contribute more to its income than do its hard copy products. In fact, CAS predicts that its electronic products will overtake their print counterparts within the next five years.

To help protect this increasingly important revenue stream, CAS recently made two controversial decisions. The more recent was its announcement that its *CAS Registry* file (an index to more than 9 million chemical substances) is withdrawn from licensing. Industry speculation is that CAS plans to make that file available solely through its own on-line service, STN International. For

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now, this will not affect users now accessing the file through vendors other than CAS (e.g., DIALOG, Telesystemes/Questel).

Earlier (mid-1987), CAS announced a change in its pricing policy that jolted the on-line community. The policy, which was introduced in January 1988, moves CAS away from pricing that is based on connect time, which is the industry's custom. It now stresses billing for each search term input and the actual search itself, rather than simply for the amount of time a user is on-line to its service.

One purpose of the new pricing policy is to make it easier for users to predict charges, according to Harry Boyle, CAS' manager of marketing services. While CAS felt the reasoning behind the policy change was sound, its announcement nonetheless provoked sharp reactions. Some vendors approved of the plan and even told CAS they wanted the plan to proceed faster; others balked. Data-Star, for example, in its December 1987 newsletter, told its users that it "disagrees with this style of charging as it is a tax on your efficiency. We feel customers should pay for data displayed, and not for how they search." DIALOG said it would pass on the price increases to users of the CAS files on its system, but it would not create search term charges.

Boyle said that a goal for 1988 was to gain acceptance of this new pricing plan. CAS representative Charles Brenner recently told Datapro that the furor has died down. While initially, users were concerned that their bills would go up, they have not seen "a major increase in their bills."

While the issue in no longer front-page news, some vendors remain critical of CAS for making these changes and question whether it deserves to retain its tax-exempt status. For its part, CAS is totally self-supporting under its charter from the American Chemical Society. Therefore, it must be certain that its revenue base increases.

RESOURCES AND FACILITIES

Programming Languages: Because CAS operates an information retrieval service exclusively, users are not involved in any programming on the system.

Customer Support Services

For clients without access to a terminal, CAS provides Registry Services to perform the search and return the results to the requestor. This service accepts written requests in the form of CAS Registry Numbers, names, and structure diagrams.

Output available from CAS Registry Services includes the following:

- CAS Registry Numbers
- CA index names
- Molecular formulas
- Structure diagrams
- Synonyms
- Connection tables

According to the vendor, CAS Registry Services are "an ideal means of building a private, in-house database."

For users with search questions, CAS maintains a toll-free number (800/848-6533) to its Search Assistance Desk, which is staffed by trained professionals. While some requests can be answered immediately, others require more detailed investigation. In either case, the service is free. CAS also offers workshops, a bimonthly newsletter, and comprehensive training programs in the use of its on-line systems and its standard published information services.

Individual Search Service (ISS)—CAS offers an ISS for use with its data. This allows a CAS user to write a profile for searching a database. The profile can be used to retrieve bibliographic citations, abstracts, and index entries. The user receives a printout every two weeks containing the information that was located. Three output options are available: *standard output*, which includes bibliographic citations, abstracts, and keyword index entries; *standard and registry number output*, which includes substances mentioned in the cited document (even though each substance may not have been mentioned in the abstract); and *standard and volume index entries output*, which includes general subject and chemical substance index entries.

PROCESSING SERVICES

Pricing

CAS' on-line charges are based on the type of search performed and the quantity of information requested. There are special rates for full-service CA (issues and indexes) subscribers. In addition, colleges and universities worldwide may qualify for the CAS Online Academic Program, which offers substantially reduced search fees during nonpeak operating hours. Academic institutions may also receive considerable discounts on workshops and CAS' manuals and search aids. For additional pricing information, please contact the vendor.

INDUSTRY-SPECIFIC SERVICES

CAS' sole purpose is to supply research information to chemical and related industries, as well as to researchers in government and university laboratories. Descriptions of CAS' major services follow:

CAS Online—a chemical search service produced by CAS and distributed through STN. CAS Online began in 1980 as a substance search service providing access to the CAS Chemical Registry System. CAS Online is primarily a

Chemical Abstracts Service (CAS)

database of chemical and chemical engineering information. It consists of three files: the Registry File, CA File, and CAOLD File.

The *Registry File* includes records for chemical substances reported in chemical literature and cited in CA since 1965. The Registry File contains more than 8.5 million substance records and 12.5 million substance names from the CAS Chemical Registry System. These are searchable in the Registry File by entering a structure diagram, a CAS Registry Number, or chemical name. Users can also search the Registry File by using a new chemical dictionary feature. This enables users to search for substances by common and trade names, molecular formulas, and chemically significant name fragments as well as by systematic names and structures. A Markush query feature permits searching for a wide range of structural features using a single structure query. Markush (generic) searching, which allows up to 20 variable groups in a structure query, enables a searcher to define with one structure diagram a broad question that previously would have required input of many structures. Another feature is an automatic Selective Dissemination of Information (SDI). A stored profile defining a searcher's interests can be run automatically against each update to the CAS Online files. Results may be viewed on-line, or CAS prints answers off-line and mails them to the searcher after each file update. The Registry File is updated weekly with approximately 10,500 substance records.

The *CA File* contains bibliographic data and CA index entries for documents cited in CA since 1967. In addition, the CA File contains complete CA abstract text for those documents abstracted since 1970. Bibliographic references and index information can be both searched and displayed in the CA File. The CA File may be searched by entering keywords, keyword phrases, CA Subject Index terms, bibliographic terms, and CAS Registry Numbers. Search queries in the file may be constructed with Boolean operators and word proximity or link operators. A user may also specify type of document (journals, patents, etc.), language of document, and other bibliographic limits. The entire CA File, since 1967, may be searched as one continuous file, or by a range of years or CA Volumes. Users can now use Registry Numbers retrieved from the Registry File to "cross over" to the CA File and retrieve CA bibliographic references, CA Index entries, or CA Abstracts for documents cited since 1967 concerning the substances identified by the Registry Numbers. In addition, some CA Citations prior to 1967 can now be retrieved by crossing over to the CAOLD File (described shortly). For these older citations, only the CA accession numbers may be retrieved. The CA File contains more than 8,200,000 citations and is updated biweekly with approximately 17,000 documents. CA abstract text can now be displayed on CAS Online for more than 7,100,000 abstracts.

STN 1988 Price Schedule

Filename	Connect Hour ($)	Online Display ($)	Offline Print ($)	SDI Search ($)
*AgPat	106.00	1.51	1.62	7.00
APILIT	110.00	0.35	0.40	3.25
APILIT2	160.00	0.50	0.55	NONE
APIPAT	110.00	0.35	0.40	3.25
APIPAT2	160.00	0.50	0.55	NONE
BIBLIODATA	106.00	0.27	0.41	5.00
*BIOCAS	35.00	0.15	0.25	NONE
BIOMASS	95.00	0.33	0.43	5.00
BIOQUIP	98.00	0.82	1.20	NONE
*BIOSIS	89.00	0.25	0.33	6.00
C13NMR/IR	147.00	FREE	NONE	NONE
*CA	106.00	1.04	1.15	7.00
*CAOLD	106.00	0.18	0.29	7.00
*CApreviews	75.00	0.53	0.64	6.00
*CASREACT	67.00	1.99	2.10	7.00
CHI	76.00	0.43	0.76	6.50
*CJACS	69.00	2.35	5.45	5.00
*CJAOAC	69.00	2.35	5.45	5.00
*CJRSC	69.00	2.35	5.45	5.00
*CJWILEY	69.00	2.35	5.45	5.00
COMPENDEX	106.00	0.38	0.51	5.00
CONF	106.00	0.33	0.43	NONE
*CSCHEM	80.00	2.00	2.16	NONE
*CSCORP	80.00	2.50	2.66	NONE
DECHEMA	109.00	0.38	0.65	8.15
DEQUIP	98.00	0.82	1.20	NONE
DERES	98.00	0.82	1.20	NONE
DETEQ	98.00	0.82	1.20	NONE
*DIPPR	60.00	15.00	15.16	NONE
ENERGIE	95.00	0.33	0.43	5.00
ENERGY	87.00	0.33	0.43	3.75
FBR	95.00	0.33	0.43	5.00
FHGPUBLICA	65.00	0.22	0.33	6.52
FORIS	81.00	0.38	0.43	6.52
FORKAT	106.00	0.54	0.65	NONE
GFI	106.00	0.41	0.52	NONE
HOME	25.00	NONE	NONE	NONE
ICONDA	119.00	0.38	0.54	6.50
*IFICDB	200.00	0.25	0.50	6.00
*IFIPAT	125.00	0.25	0.50	6.00
IFIREF	105.00	FREE	0.15	NONE
*IFIRXA	105.00	3.00	4.00	NONE
*IFIUDB	300.00	0.25	0.50	6.00
INFORBW	106.00	0.54	0.65	NONE
*INPADOC	125.00	20.00	20.00	NONE
*INPAMONITOR	125.00	20.00	20.00	7.00
INSPEC	106.00	0.57	0.62	5.00
*JANAF	75.00	1.00	1.10	NONE
JICST-E	90.00	0.33	0.47	6.36
KKF	109.00	0.38	0.65	8.15
LBIBLIO	30.00	NONE	NONE	NONE
LCA	30.00	FREE	NONE	NONE
LCJO	25.00	FREE	NONE	NONE
LHB	76.00	0.43	0.76	6.50
LPHYS	30.00	FREE	NONE	NONE
LREGISTRY	30.00	FREE	NONE	NONE
MATBUS	90.00	0.41	0.46	5.00
MATH	106.00	0.33	0.43	5.00
MEET	106.00	0.38	0.51	5.00
METADEX	90.00	0.41	0.46	5.00
NTIS	69.00	0.41	0.46	3.75
PATDPA	155.00	0.54	0.65	2.20
PATGRAPH	30.00	1.09	1.36	NONE
*PharmPat	106.00	1.51	1.62	7.00
PHYS	106.00	0.52	0.57	3.75
*REGISTRY	67.00	1.38	1.49	10.00
RSWB	119.00	0.38	0.54	6.50
SILICA	87.00	0.38	0.49	4.34
SITRAFO	106.00	0.54	0.65	NONE
SOLIS	81.00	0.38	0.43	6.52
TA	106.00	0.54	0.65	NONE
TITUS-E	106.00	0.41	0.51	5.00
*TOXLIST	50.00	15.00	15.11	10.00
VADEMECUM	106.00	0.33	0.57	NONE
VTB	92.00	0.33	0.46	10.90

**Contact STN for more detailed pricing on these files.*

The *CAOLD File* contains references to pre-1967 literature. The CAOLD File is being expanded incrementally as substances cited in CA prior to 1967 are added to the

Chemical Abstracts Service (CAS)

Chemical Registry. For these older citations, only the CA accession numbers may be retrieved.

The information in CAS Online is derived from documents published in 50 different languages in nearly 150 countries. CAS Online is derived from the same CAS database that produces the *Chemical Abstracts* publication. The original literature cited in CAS Online includes journal articles from any of 12,000 publications; patents from 27 nations, the European Patent Organization, and the World Intellectual Property Organization; books; dissertations; proceedings; and other scientific and technical documents pertinent to chemistry and chemical engineering.

Private Registry Service—for users with an interest in substances displaying particular characteristics, CAS routinely generates a private registry, available only to the sponsoring organization, which includes only references to substances meeting the selection criteria specified by the client.

NETWORKING SERVICES

CAS' system is available through the Telenet, Tymnet, and CompuServe international telecommunications networks. Any terminal equipment that can communicate over these networks is compatible with the CAS Online system.

MICROCOMPUTER/SOFTWARE SERVICES

STN Mentor

STN offers a series of tutorial diskettes for learning how to use its system. Currently, the series includes *STN Mentor/STN Overview*, *STN Mentor/Introduction to CAS Online*, and *STN Express Overview*. The diskettes guide users step-by-step through simulated on-line searches for answers to common research problems. They operate on IBM PC and 100 percent-compatible microcomputers.

Other lessons in the *STN Mentor* series are planned. Candidates for subjects to be covered include author searching, health and safety, polymer information on STN, and lessons on specific STN databases.

STN Express

STN Express is an "automatic login" package designed to simplify the procedure for accessing STN International. The software makes the search easier by limiting user involvement. A series of menus guide the user in developing a search strategy. (Search questions may be phrased using either chemical structures or words.) From there, the software automatically logs on to STN International, runs the search, and displays results.

ON-LINE DATABASES

CAS Online (through the STN network) is the only database offered by CAS in Columbus, Ohio. Additional files including *CA Search*, *CA Index Guide*, *Chemical Industry Notes* and others are distributed on magnetic tape to independent vendors for public accessing. The following is a list of some of the databases produced by CAS:

Registry File—contains a structure-based index to more than 9 million substances referred to by more than 12 million names. Each substance entered into the database is assigned a unique CAS Registry Number. All common, trade, and systematic names used by authors and inventors to refer to the substance are also recorded and linked to the entry.

It is therefore possible to locate a substance by CAS Registry Number or by a full or partial structure diagram.

CA Index Guide—contains 195,000 cross-references and indexing notes for use with CAS volume index entries. It is designed for engineering and scientific use and is updated semiannually. The Index Guide is a file of cross-references for linking commonly used names of chemical substances and terms.

CAPREVIEWS—the previews file for the *Chemical Abstracts* file. It includes essential bibliographic information (without abstracts or indexing information) six to eight weeks before either the printed information appears in *Chemical Abstracts* or its on-line equivalent.

CA Search—contains bibliographic information, along with keyword and volume index entries to worldwide chemistry literature. Sources for this information include journal articles, monographs, conference proceedings, technical reports, and patents.

STN International, the international on-line network offered cooperatively by the American Chemical Society; West Germany's Fachinformationszentrum Energie, Physik, Mathematik GmbH (FIZ Karlsruhe); and the Japan Information Center of Science and Technology offers the following databases:

AGPAT—the CAS on-line agrochemical patents file, covering 1987 to the present.

APILIT—the API literature file from 1964 to the present (subscribers).

APILIT2—the API literature file from 1964 to the present (nonsubscribers).

APIPAT—the API patent file from 1964 to the present (subscribers)

APIPAT2—the API patent file from 1964 to the present (nonsubscribers)

Chemical Abstracts Service (CAS)

BIBLIODATA—German national bibliography from 1972 to the present.

BIOCAS—links the BIOSIS Previews Document Number to the equivalent CA file citation. It includes CAS Registry Numbers as access points to the documents in the BIOSIS Previews database.

BIOMASS—literature on all aspects of biomass including production, harvesting, collection, processing, transportation, and conversion techniques.

BIOQUIP—the DECHEMA bioequipment suppliers database.

BIOSIS Previews—encompasses the entire field of the life sciences, covering original research reports, reviews, and selected U.S. patents in biological and biomedical areas.

CASREACT—a reaction service, providing information on thousands of reactions, including organometallics and biomolecules, selected from papers reported in 100 key journals.

CHI—Chemical Hazards in Industry, CHI, contains information on the hazards caused by chemicals likely to be encountered in the chemical and allied industries.

CJACS—chemical journals of the American Chemical Society.

CJAOAC—chemical journals of the AOAC.

CJRAC—chemical journals of the Royal Society of Chemistry.

CJWILEY—chemical journals from John Wiley & Sons, Inc.

CLAIMS—The CLAIMS patent files, IFIPAT, IFIREF, IFIUDB, and IFIRXA, contain data on U.S. patents. For specific information regarding these separate files, contact STN.

COMPENDEX—contains citations, with abstracts, to world engineering and technology literature, including water, mining, industrial, metal, pollution, computer, electronic, and civil engineering.

CONF—information on energy, physics, mathematics, computer science, aeronautics and astronautics, space research, astronomy and astrophysics, and engineering conferences.

CSCHEM—ChemSources-USA (chemical and trade name sections).

CSCORP—ChemSources-USA (company section).

C13-NMR/IR (C13 Nuclear Magnetic Resonance)—a database providing more than 83,000 spectra for 67,000 compounds. The database includes information on chemical shifts, experimental conditions, chemical names, bibliographic references, molecular formulas, structural diagrams, coupling constants, and relaxation times.

DECHEMA—a chemical engineering file referencing chemical equipment and biotechnology publications.

Dequip (DECHEMA Equipment Suppliers Data Bank)—covers manufacturers of apparatus and technical equipment in the fields of chemical engineering and biotechnology. The database currently reviews about 2,600 companies worldwide.

Deteq (DECHEMA Environmental Technology Equipment Bank)—covers the manufacture of apparatus and technical equipment in the field of environmental engineering. The database reviews about 600 companies and their products.

Energie—German and English citations on energy-related literature published in German-speaking countries.

Energy—an English-language file containing more than 1.5 million citations on energy research and technology literature. Abstracts are included.

FBR—German R&D ministry reports from 1985 to the present.

FHGPUBLICA—publications of the Fraunhofer Society from 1982 to the present.

FORIS—research in the social sciences from 1973 to the present.

FORKAT—BMFT Foerderkatalog.

GFI—contains the *Gmelin Formula Index and the Complete Catalog*, which are supplements to the *Gmelin Handbook of Inorganic Chemistry.*

Iconda—the database of the International Council for Building Research Studies and Dokumentation (CIB). It cites worldwide publications, including "gray" literature, dealing with building construction, construction engineering, architecture, and city planning.

IFICDB—the IFI comprehensive database from 1950 to the present.

IFIPAT—the IFI patent database from 1950 to the present.

IFIREF—the IFI UNITERM and U.S. Class Reference file.

IFIRXA—the IFI Reassignment and Reexamination database.

Chemical Abstracts Service (CAS)

IFIUDB—the IFI Uniterm database from 1950 to the present.

INFORBW—Badem-Wuerttemberg Institues and Research in Progress.

INIS—International Nuclear Information System, 1970 to the present.

INPADOC—INPADOC bibliographic, family, and legal status from 1968 onward.

INPAMONITOR—INPADOC file for SDI.

Inspec—citations, with abstracts, to worldwide literature on physics, electronics and electronic engineering, computer and control, and information technology literature.

JANAE—JANAF Thermonuchemical Tables, 3rd Edition.

JICST-E—JICST English file on science and technology in Japan.

KKF (Kunststoffe, Kautschuk, Fascern)—a German-language database containing citations covering the literature on the production, applications, and technological properties of plastics.

LBIBLIO—bibliodata learning file.

LCA—a training database for new users of the *Chemical Abstracts* file.

LCJO—the learning file for *Chemical Journals Online.*

LHB—the Laboratory Hazards Bulletin database contains information from journals, books, conference papers, films, and press releases on potential hazards for chemical and biochemical research workers.

LPHYS—the PHYS learning file.

LREGISTRY—a training database for new users of the *Registry* file.

MATBUS—Materials Business file from 1983 to the present.

MATH—contains citations from worldwide publications in pure and applied mathematics. The file covers journals and serials, books, and proceedings.

MEET—contains more than 340,000 citations of the published proceedings from engineering-related meetings, conferences, and seminars held worldwide from 1982 onward.

METADEX (Metals Abstracts and Alloy Index)—over 645,000 citations to world metallurgy and metallic material literature.

NTIS—a multidisciplinary file produced by the National Technical Information Service (NTIS). The sources reviewed for the database include publications (especially unrestricted reports) on research, development, and engineering projects sponsored by the U.S. and other governments.

PATDPA—a German patent database containing references to German scientific and technological patents, patent applications, and utility models. All of the records are in German.

PHARMPAT—CAS Online Pharmaceutical Patents file, from 1987 to the present.

PHYS—covers the literature in physics and related fields. The information for the database is derived from journals published by the American Institute of Physics as well as journals from other American sources. Also, nonconventional literature and publications in Eastern European languages are indexed and abstracted for the database.

RSWB—a German-language database containing information on regional and city planning and housing.

SILICA—ceramics and glass database from 1975 to the present.

SITRAFO—university research and development projects for technology transfer.

SOLIS—German literature in the social sciences from 1945 to the present.

TA—the Technology Assessment database.

TITUSE—the textile database in English from 1968 to the present.

TOXLIST—information concerning chemical substances listed on the EPA Toxic Substances Control Act Inventory or subject to EPA regulations under TSCA or similar legislation.

Vademecum—references to educational and research institutions in the Federal Republic of Germany.

VtB—covers journals, technical reports, conference proceedings, and other nonconventional literature in chemical engineering and plant equipment.

Table 1 provides pricing information for these files. For further information on STN, contact STN-Columbus, P.O. Box 02228, Columbus, Ohio 43202.

OTHER SERVICES

CAS offers the CA Search chemical database. Versions of this database are available on systems operated by BRS Information Technologies, DIALOG Information Ser-

> vices, Inc., SDC's ORBIT Search Service, and other organizations in the U.S., Europe, and Japan.

CAS also offers *CAS Search Service*, allowing users to submit questions by mail or telephone to a CAS search coordinator. The search coordinator formulates a search query, runs it against the appropriate CAS file, and mails retrieved answers to the user. This service is intended to help those who lack the equipment or training to perform an on-line search. Files that can be searched through this service include *CA Search*, *CAS Online*, and *Chemical Industry Notes.*

CAS offers a Document Delivery service that provides copies of original articles abstracted or cited in CAS publications for the past 10 years (15 for Soviet documents). Also available are all U.S. patents from 1971 to the present, most foreign chemical patents since 1978, and American Chemical Society journals from initial publication to the present. Users may order documents through cable, telex, STN Order, BRS, Dialorder, OCLC, ORBDOC, PrimorDial or by writing or calling CAS.

CAS continues to publish *Chemical Abstracts* and its indexes on paper and microform. It also publishes a variety of special publications that concentrate on narrower areas of interest, such as biochemistry and biotechnology.

FUTURE PLANS

Chemical Abstracts Service reports that it is developing an enhanced patents service, a reaction search service, and new techniques for searching Markush structures derived from patent documents. ☐

CompuServe, Incorporated

COMPANY INFORMATION

CompuServe, Inc.
P.O. Box 20212
Columbus, Ohio 43220 (614) 457-8600

UPDATE: *In June 1989, CompuServe acquired Source Telecomputing Co. of McLean, Virginia, its longtime competitor. CompuServe continued operating The Source information service until August 1 to allow for a smooth consolidation of the two memberships. Since acquiring The Source, CompuServe has incorporated some of The Source's on-line services with its own information service, making it the largest on-line information service for the microcomputer user.*

CompuServe, Inc., an H&R Block company, is one of the nation's major providers of telecommunications networking services, electronic mail systems, and on-line consumer and business information services. The CompuServe Information Service began in 1979 with fewer than 1,000 subscribers; today, it provides over 500,000 members with on-line services including electronic mail, personal computing support, and interactive games. Also featured is an electronic mall, financial and reference information, an encyclopedia, news wires, sports and weather information, and electronic magazines. Through its Executive Service Option, CompuServe also offers enhanced business data for executive users.

In addition, CompuServe provides information services to organizations of all sizes, including many *Fortune* 500 companies. Its software applications include banking management, financial planning and analysis, database management and graphics, investment banking, management sciences, and research and development.

CompuServe operates its own data communications network. This value-added network is accessible via a local telephone call in more than 500 U.S. cities and more than 100 foreign countries.

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Company Background

Founded as a computer timesharing company in 1969, CompuServe entered the electronic information industry a decade later when it introduced the MicroNet on-line service. CompuServe created MicroNet in a bid to turn idle computer capacity into income. The service was originally geared to computer hobbyists wanting access to the company's mainframes for writing and running programs. CompuServe soon enhanced MicroNet with features such as stock quotes and weather information. The vendor renamed MicroNet in 1980 as the CompuServe Information Service.

H&R Block, Inc. acquired CompuServe that same year and has put its ample financial resources behind the company ever since. Consequently, CompuServe has moved into new markets, developed new services, and expanded existing ones. CompuServe is now a major supplier of telecommunications, electronic mail, and business information services. Today, CompuServe also markets database management and business software to Digital VAX and Hewlett-Packard 3000 users. The CompuServe Information Service offers over 400 electronic information databases and services.

With a staff of more than 1,400, CompuServe has sales offices nationwide. Its customers use CompuServe's telecommunications network to access the company's data centers in Columbus and nearby Dublin, Ohio. In addition, the CompuServe network is also offered as a value-added network (VAN) service, enabling users to access its host computers.

CompuServe describes its customers as "upscale," with an average family income of $70,000 per year. While its customers remain largely male (average age 36), CompuServe says other family members are now using the service more frequently.

CompuServe's revenues for the fiscal year ending April 30, 1989 were $173 million.

Competitive Position

CompuServe's acquisition of The Source eliminates it as a competitor. The Source and CompuServe were the two top companies in the videotex industry for many years, although recently The Source had floundered. CompuServe now faces more competition from GEnie, an information service from GE Information Services. Similar to CompuServe, but on a smaller scale, GEnie is gaining subscribers fast, topping the 160,000 mark. Another CompuServe competitor, Dow Jones News/Retrieval, primarily serves corporate users and does not have as broad a reach as CompuServe. CompuServe will also face increasing competition from new videotex companies now springing up, many of which are regional. Prodigy, a joint offering of Sears and IBM, may also encroach on CompuServe's territory. Prodigy is now available in more than a dozen metropolitan areas; it will be available nationwide within a year.

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CompuServe, Incorporated

▷ CompuServe represents one of the industry's most impressive success stories. Its base of more than 500,000 subscribers is the industry's largest. And it adds 6,000 to 7,000 people monthly, a pace it has maintained for years.

A recently instituted monthly fee of $1.50 ($18.00 per year) may be turning away some of CompuServe's subscriber base. Since maintaining a membership had cost nothing beyond the initial charge for the membership kit, some subscribers have left the service rather than pay the fee.

For others, the many enhancements that CompuServe regularly adds to its service are enticements to stay. For example, the company recently implemented a "learning center" for its forums. Free of connect-time charges, it lets users get a feel for how the forums work and how to navigate them. Other enhancements include a competitively priced "Computer Library," a database covering computer topics. The vendor plans more such databases.

RESOURCES AND FACILITIES

Processing Centers

CompuServe maintains computer centers in Columbus and Dublin, Ohio. The mainframe computers at these two centers feature more than 39 Digital Equipment Corporation central processors. A proprietary integrated command system, which is available from more than 500 U.S. cities on the CompuServe network and from other cities through Tymnet or Telenet, governs access to these computers.

Customer Support Services

CompuServe's Customer Service Department assists subscribers with problems and questions. Although this department does not provide detailed programming or debugging assistance, it does answer programming-related questions and will report system bugs. CompuServe subscribers can use many different applications, and the staff has documentation for each package or application.

The Customer Service Department has incoming WATS lines that serve customers and branch offices all over the United States.

Sales and Marketing Services

The CompuServe Information Service

New subscribers can buy CompuServe membership kits from computer specialty or other retail stores. These kits sell for $39.95 and include a user number and password, a User's Guide, and a $25.00 usage credit. CompuServe also has many OEM agreements with manufacturers of modems and communications software. Purchasers of their products typically receive a CompuServe password, introductory information (but no User's Guide), and a $15 CompuServe credit. Finally, membership kits may be ordered from CompuServe directly by calling (800) 848-8199.

Business Services

CompuServe markets a range of electronic mail and value-added network services to major corporations through a network of 31 field offices strategically located throughout the United States.

INDUSTRY-SPECIFIC SERVICES

The CompuServe Information Service

CompuServe provides application-specific services to both business and home personal computer/terminal users via the CompuServe Information Service. Applications include financial, data communications, data and database management, research and development, management sciences, mathematics and statistics, graphics, data retrieval, entertainment, and travel.

The following are typical services CompuServe provides:

- *News and Information*—Users have access to international, national, regional, and local news, weather, and sports and commentaries from an international news service and prominent news publications. Information is also available on subjects such as energy management, food recipes, meal preparation, nutrition, personal health, gardening, home decorating, building, crafts, travel, and money management.
- *Electronic Mail (Easyplex)*—Users can exchange messages with other CompuServe subscribers and Telex and MCI Mail users and transmit to fax machines worldwide.
- *Bulletin Boards*—CompuServe offers more than 175 subject-specific forums (Special Interest Groups), containing message boards, data libraries, and live conferencing capabilities. Forum topics include personal investing, travel, personal computing support, sports, education, and entertainment.
- *Financial Information*—Users can access the latest stock quotes, updated throughout the trading day; research the historical performance of more than 40,000 stocks, bonds, and options; and review more than 400 information items on 1,800 companies. Sources for business-related financial information include the financial pages of major newspapers, a financial news wire, and a specialized business wire for corporate news releases. Personal financial services include home mortgage loan computations, depreciation analysis, home banking, bill payments and funds transfer, and on-line brokerage services.

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CompuServe, Incorporated

- *Entertainment*—Users have access to movie and book reviews; sports information; and a variety of games.

- *Personal Computing*—CompuServe offers a multitude of technical capabilities for personal computers. The *Softex service enables customers to purchase software electronically and have it downline loaded into their personal computers error free and ready to run.*

Pricing Information

CompuServe's basic access rates are $6.00 per hour for 300 and 450 bps access and $12.50 per hour for 1200 and 2400 bps access. These rates apply at all times—CompuServe does not distinguish between peak and off-peak access.

CompuServe's Business Services

CompuServe's business clients include corporations and government agencies.

CompuServe's business services group offers electronic mail services, database access, software, and value-added packet data network services within its Business Services Division.

Business Services Division

This division offers the following products:

Computer Communications Services

Products offered include InfoPlex, an electronic mail system offered both as a standalone product and as a component of Interchange, CompuServe's private videotex service for companies. Optional Interchange features include gateways to external databases and electronic conferencing.

Financial Analysis Databases

CompuServe's financial databases for its business customers provide data on publicly held companies and include forecasts and corporate profiles from Standard & Poor's, Value Line, and other sources. Databases offered include:

Banking Data Service (BDS)—profiles of commercial banks, savings and loans, and holding companies, consisting of balance sheet, profit and loss, and schedule details.

Commodities Database—daily price history on commodity futures and cash prices.

COMPUSTAT II—more than 20 years of fundamental financial data, covering 6,000 public firms.

Disclosure II—SEC filing information, both financial and textual, for over 8,500 public companies.

Institutional Brokers' Estimate System (I/B/E/S)—monthly earnings-per-share estimates for the stock issues of more than 3,000 companies.

International Securities—daily price history on more than 27,000 stocks, options, and bonds traded on markets outside North America.

North American Securities (VALUE)—an interactive securities database system giving the daily price history of over 50,000 stocks, options, bonds, and indexes.

Quick Quote—20-minute-delayed stock quotes on over 9,000 public firms.

Securities Market Data—a system of databases and programs that retrieves historic or current securities pricing data.

Standard & Poor's Register Online—descriptive data on business aspects, compiled by S&P analysts, on more than 45,000 private companies.

10K PLUS—a system of financial planning software that manages historical and current financial data usage.

Value Line Database II—historical financial data and forecasts for more than 1,800 firms.

Demographic Services Databases

CitiBase—a time-series database containing national income and product accounts and other aggregate time-series for the U.S. since 1946.

Demographic Online Retrieval Information System (DORIS)—demographic profiles and potential sales data; can be configured to download information for use with microcomputers.

SUPERSITE—a census-supported database providing current demographic, housing, and sales data for U.S. demographic areas.

Database Management Systems

System 1022—database management software system; supports simultaneous access by multiple users.

ECL/80—expands System 1022 capabilities by supporting joint authorship of reports.

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CompuServe, Incorporated

▷ Research and Development Systems

Response Surface Methodology—a research and development tool that assists in experimental design and data analysis, producing optimum new product formulations or existing product upgrades.

Computer Optimized Experimental Design (COED)—an experimental design tool for researchers.

Network Services Division

This division offers value-added data communications services. CompuServe's packet switched network is accessible by local dial-up from 500 major U.S. cities and more than 100 foreign countries.

Personal computers equipped with a modem and terminal software can access the CompuServe Information Service. In general, any standard ASCII data terminal with a modem can be used. Even word processors with asynchronous communications and a modem can access CompuServe. Communications specifications are:

- 110, 300, 1200, or 2400 baud (in selected cities)
- Full or half duplex
- One stop bit for 300 and 1200 baud; two stop bits for 110 baud
- Standard ASCII code
- Seven data bits with an even parity bit, or eight data bits with no parity bit

Information Transfer

This service enables businesses to connect widely dispersed employees, customers, and suppliers to a host computer at CompuServe's Columbus headquarters or to the company's own computer.

Point-of-Service (POS) Applications

These link multiple terminals with a remote host computer, usually for credit card authorization. Retail merchants can determine within 20 seconds whether a card is lost, stolen, or otherwise unauthorized.

Software Products Division

Via three wholly owned subsidiaries, CompuServe's Software Products Division provides complementary information systems to support its commercial client base. These three software developers are described below.

Access Technology, Inc.

This company develops, markets, and supports spreadsheet modeling software for use on several computer systems. Access' primary product is 20/20, a spreadsheet program that runs on mainframe, workstation, and mini- and microcomputers.

Collier-Jackson, Inc.

Collier-Jackson, Inc. develops, installs, and supports online software for the Digital VAX series and the Hewlett-Packard HP 3000 series of minicomputers. Its product line includes human resource, financial, and administrative management systems for cross-industry business applications. Collier-Jackson newspaper systems assist in managing the circulation, business, and advertising departments of daily and weekly newspaper publishers.

CompuServe Data Technologies

This subsidiary develops, markets, and supports two major multiuser database management and fourth-generation language products for Digital computers: System 1022 and System 1032. ☐

CompuServe Network Services

CompuServe Network Services (CNS) is CompuServe, Inc.'s virtual circuit switched data network system. Capable of interfacing with most host computers using synchronous (X.25), bisynchronous (3270), or asynchronous protocols, the system is a conduit for all CompuServe services, both business and consumer. The network consists of MicroNodes (small-to-medium sized computer systems) arranged geographically in a modified ring design communicating with each other over leased lines, satellite, or microwave links to provide a virtual circuit.

CNS has grown significantly over the last couple years. CNS now provides remote computing services to more than 300 major U.S. cities and 92 foreign countries. It now serves 200 business clients and adds about 70 to 80 new clients each year. Such value-added services as electronic point-of-sale (POS) credit card authorization and an electronic mail service contribute to CNS' success.

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COMPANY INFORMATION

CompuServe Network Services
5000 Arlington Centre Boulevard
Columbus, Ohio 43220
Telephone (614) 457-8600

Company Background

CompuServe Network Services (CNS), a division of CompuServe, Inc., offers data communications services throughout the United States and 92 foreign countries. CNS provides access to public data communications networks and develops private, exclusive communications networks.

Parent company CompuServe, Inc. is a subsidiary of H&R Block. CompuServe specializes in remote computing, electronic information, and data communications services. According to the vendor, the data communications network enables CompuServe to better serve its customers through "quality control and effective service."

Currently, CompuServe Information Service has more than 420,000 subscribers and provides information on such subjects as adult education, automobiles, business news, entertainment, movie reviews, investments, health, travel, weather, and world news. CompuServe also provides on-line services to 1,300 major U.S. corporations and government agencies. CNS now serves over 200 clients, as compared to 30 four years ago. The division's current growth rate is about 70 to 80 new clients each year.

The CompuServe Network is also used to provide a private communications network for users with large-volume data transmission requirements. In addition, the network is used by commercial customers using CompuServe's electronic mail system (Infoplex) or private videotex system (Interchange).

In March 1988, CompuServe Network Services began the first phase of a pilot program to provide 9600 bps access in 10 cities. Hayes V-Series Smartmodem 9600 modems were installed at CompuServe node sites in New York City; Boston; Washington, DC; Detroit; Columbus, Ohio; Dallas; Chicago; Atlanta; San Francisco; and Los Angeles.

Competitive Position

One of the larger value-added networks, CompuServe Network Services competes with GE Information Services Company (GEISCO), Tymnet, and Telenet. Many of CompuServe, Inc.'s consumer videotex customers use the CompuServe Network.

CNS has grown steadily and the company expects continued growth. In early 1988, the company announced the purchase of nine SC-25 mainframe processors from Systems Concepts. The new processors will replace the company's aging mainframes. CNS also announced a pilot program to provide 9600 bps access in 10 U.S. cities.

NETWORK DESIGN

The CompuServe Network is a virtual circuit switched data network that promotes the use of the International Consultive Committee for Telegraphy and Telephony (CCITT) X.25 standard packet-switching protocol called HDLC/LAPB. CompuServe Network interfaces to virtually any host computer using the synchronous (X.25), bisynchronous (3270), or asynchronous protocol. On the terminal side, CompuServe Network supports strictly asynchronous terminals and personal computers that have asynchronous communications capabilities.

The network consists of many small-to-medium scale computer systems called MicroNodes (MNs), which are strategically located throughout the country. By the use of what CompuServe Network calls "distributed intelligence," each node is equally capable of establishing a path throughout the network. The MicroNodes are linked by specially conditioned telephone lines that transmit data at a rate of 9600 baud. The end user determines the baud rate at which he or she will actually receive the information.

▷

CompuServe Network Services

- AB Edmonton
- AK Anchorage
- AK Fairbanks
- AL Bessemer
- AL Birmingham
- AL Florence
- AL Huntsville
- AL Mobile
- AL Montgomery
- AL Tuscaloosa
- AR Little Rock
- AZ Mesa
- AZ Phoenix
- AZ Scottsdale
- AZ Sierra Vista
- AZ Tempe
- AZ Tucson (2)
- AZ Yuma
- BC Vancouver
- CA Alameda
- CA Anaheim
- CA Bakersfield
- CA Berkeley
- CA Beverly Hills (2)
- CA Canoga Park
- CA Castro Valley
- CA Cathedral City
- CA Concord
- CA Culver City (3)
- CA Cupertino
- CA Encinitas
- CA Fresno
- CA Glendale
- CA Hayward
- CA Inglewood (2)
- CA Irvine
- CA Livermore
- CA Long Beach
- CA Los Altos
- CA Los Angeles
- CA Modesto
- CA Monterey
- CA Mountain View
- CA N. Hollywood
- CA Napa
- CA Newport Beach
- CA Oakland
- CA Oxnard
- CA Pacheco
- CA Palm Springs
- CA Palo Alto (2)
- CA Pleasant Hill
- CA Pomona
- CA Riverside
- CA Sacramento
- CA Salinas
- CA San Bernardino (2)
- CA San Carlos (2)
- CA San Diego (3)
- CA San Fernando (2)
- CA San Francisco (2)
- CA San Jose
- CA San Luis Obispo
- CA San Marcos
- CA San Mateo (2)
- CA Santa Barbara
- CA Santa Clara
- CA Santa Cruz
- CA Santa Rosa
- CA Sherman Oaks
- CA Sierra Madre
- CA So. Lake Tahoe
- CA Solana Beach
- CA Stockton
- CA Sunnyvale
- CA Thousand Oaks
- CA Van Nuys
- CA Ventura
- CA Walnut Creek
- CA West L.A. (2)
- CO Aspen
- CO Aurora
- CO Boulder
- CO Colorado Springs
- CO Denver
- CO Dillon
- CO Durango
- CO Ft. Collins
- CO Glenwood Spring
- CO Grand Junction
- CO Lakewood
- CO Longmont
- CO Loveland
- CO Puebio
- CO Vail
- CT Bridgeport
- CT Danbury
- CT Fairfield
- CT Greenwich
- CT Hartford
- CT Milford
- CT New Haven
- CT New London
- CT North Haven
- CT Norwalk
- CT Stamford
- CT Waterbury
- CT Westport
- DC Washington (3)
- DE Newark
- DE Wilmington
- FL Boynton Beach (2)
- FL Deerfield Beach
- FL Ft. Lauderdale (2)
- FL Ft. Myers
- FL Jacksonville
- FL Melbourne
- FL Miami
- FL Orlando
- FL Panama City
- FL Pensacola
- FL Sarasota (2)
- FL St. Petersburg
- FL Tallahassee
- FL Tampa
- FL Vero Beach
- FL West Palm Beach
- FL Winter Haven
- GA Albany
- GA Atlanta
- GA Augusta
- GA Macon
- GA Martinez
- GA Savannah
- HI Kailua
- HI Maui
- IA Cedar Rapids
- IA Davenport
- IA Des Moines
- ID Boise
- ID Ketchum
- ID Pocatello
- IL Aurora
- IL Bloomington
- IL Champaign
- IL Chicago (3)
- IL East St. Louis
- IL Lombard
- IL Peoria
- IL Rockford
- IL Springfield
- IN Elkhart
- IN Evansville
- IN Ft. Wayne
- IN Gary
- IN Indianapolis (2)
- IN Lafayette
- IN Muncie
- IN Richmond
- IN South Bend
- KS Mission
- KS Shawnee
- KS Shawnee Mission
- KS Topeka
- KS Wichita
- KY Lexington
- KY Louisville
- KY Owensboro
- LA Baton Rouge
- LA Lafayette
- LA Lake Charles
- LA Monroe
- LA New Orleans
- LA Shreveport
- MA Amherst
- MA Arlington
- MA Boston
- MA Brockton
- MA Brookline
- MA Burlington
- MA Cambridge
- MA Chicopee
- MA Concord
- MA Fall River
- MA Framingham
- MA Groton
- MA Hudson
- MA Lawrence
- MA Maynard
- MA Medfield
- MA Medford
- MA Medway
- MA Mendon
- MA Newton
- MA Qunicy
- MA Springfield
- MA Waltham
- MA Westboro
- MA Worcester
- MD Annapolis
- MD Baltimore
- MD Bethesda (2)
- MD Dundalk
- MD Hyattsville (2)
- MD Ocean City
- ME Portland
- MI Ann Arbor
- MI Detroit
- MI East Lansing
- MI Flint
- MI Grand Rapids
- MI Kalamazoo (2)
- MI Lansing
- MI Mt. Clemens
- MI Pontiac
- MI Saginaw
- MI Troy
- MN Minneapolis
- MN St. Paul
- MO Columbia
- MO Florissant
- MO Independence
- MO Jefferson City
- MO Kansas City
- MO St. Louis
- MS Jackson
- MT Billings
- MT Helena
- NC Asheville
- NC Burlington
- NC Charlotte
- NC Davidson
- NC Durham
- NC Greensboro
- NC Raleigh
- NC Research Triangle Park
- NC Wilmington
- NC Winston-Salem
- NE Lincoln
- NE Omaha
- NH Nashua
- NJ Atlantic City
- NJ Bayonne
- NJ Camden
- NJ Cherry Hill
- NJ Elizabeth
- NJ Greenbrook
- NJ Hackensack
- NJ Hackettstown (2)
- NJ Jersey City
- NJ Montclair
- NJ Morristown
- NJ Newark
- NJ Parsippany
- NJ Pennsauken
- NJ Princeton
- NJ Ridgewood
- NJ Rochelle Park
- NJ Toms River
- NJ Union
- NJ Union City
- NJ Wayne
- NJ Woodbridge
- NM Albuquerque
- NM Los Alamos
- NV Las Vegas
- NV Reno
- NY Albany
- NY Binghamton
- NY Buffalo
- NY Hicksville
- NY Ithaca
- NY Lake Grove
- NY Limestone
- NY Middletown
- NY New York (3)
- NY Niagara Falls
- NY Poughkeepsie
- NY Rochester
- NY Schenectady
- NY Syracuse
- NY Tonawanda
- NY Troy
- NY White Plains
- NY Williston Park
- OH Akron
- OH Athens
- OH Cambridge
- OH Canton (2)
- OH Cincinnati
- OH Cleveland
- OH Columbus (2)
- OH Dayton
- OH Euclid
- OH Granville
- OH North Canton
- OH Parma
- OH Ravenna
- OH Toledo
- OH Youngstown
- OK Bethany (2)
- OK Norman (2)
- OK Oklahoma City (2)
- OK Tulsa
- ON Toronto
- OR Eugene
- OR Medford
- OR Portland
- OR Salem
- PA Allentown
- PA Butler
- PA Erie
- PA Harrisburg
- PA King of Prussia
- PA Norristown
- PA Penn Hills (2)
- PA Philadelphia
- PA Pittsburgh (2)
- PA Reading
- PA Somerset
- PA Upper Darby
- PA York
- PQ Montreal
- PR San Juan
- PR Santurece
- RI Providence
- SC Charleston
- SC Columbia
- SC Greenville
- SC Myrtle Beach
- SC Spartanburg
- SD Rapid City
- TN Chattanooga
- TN Gatlinburg
- TN Johnson City
- TN Knoxville
- TN Memphis
- TN Nashville
- TN Oak Ridge
- TX Abilene
- TX Amarillo
- TX Austin
- TX Conroe
- TX Corpus Christi
- TX Dallas (2)
- TX El Paso
- TX Ft. Worth
- TX Galveston
- TX Houston
- TX Laredo
- TX Lubbock
- TX Midland
- TX San Antonio
- UT Provo
- UT Salt Lake City
- VA Alexandria (2)
- VA Arlington
- VA Charlottesville
- VA Chesapeake (2)
- VA Fairfax
- VA Hampton
- VA Manassas
- VA Newport News
- VA Norfolk (2)
- VA Portsmouth (2)
- VA Richmond
- VA Roanoke
- VA Virginia Beach (2)
- VA Williamsburg
- VT Burlington
- WA Olympia
- WA Seattle (2)
- WA Spokane
- WA Tacoma
- WI Brookfield
- WI Green Bay
- WI Madison
- WI Milwaukee
- WI Wauwatosa
- WV Charleston
- WV Huntington
- WV Parkersburg
- WV Wheeling
- WY Casper
- WY Cheyenne
- WY Jackson
- WY Laramie

NOTE: A number in parentheses after a city indicates the number of nodes in that city.

Figure 1. CompuServe Network service locations.

CompuServe Network Services

Internally, the nodes use a proprietary synchronous protocol to communicate with each other over a variety of transmission media, including leased lines, satellite, and microwave links. The nodes are arranged geographically in a modified ring design, providing alternate routing should a line become temporarily inoperative. Almost no location is dependent on another single location for connection to other areas.

The nodes communicate over these circuits in a background mode to gather network performance parameters every few minutes. Using this information, when a user requests service, each node is capable of choosing the least-delayed path it can find, thus creating an optimal virtual circuit.

A transparent virtual circuit is maintained for the duration of the remote computing session through as many nodes as necessary. When the session is completed, the virtual circuit is terminated. If another session is requested between the same parties, the same path or a different path may be used, depending on which path is optimal at that moment. This is known as circuit switching.

CompuServe Network uses dynamic adaptive routing to gather performance statistics and establish virtual circuits. Each node in the path uses a technique called "route through" to keep the virtual circuit in service. The routing techniques used by CompuServe Network permit the nodes to operate autonomously without a master or supervisor machine to direct traffic. As a result, large geographic failures are nearly impossible. By being independent of a networked group of nodes and transmission facilities, delays during peak traffic hours are eliminated. By use of the above described design techniques, CompuServe claims a 10 to 20 percent improvement over other value-added networks.

Each MicroNode in the CompuServe Network has its own uninterruptible power supply system to protect against power spikes and outages and to ensure continued operation. The MicroNodes are also equipped with diagnostic control microprocessors and separate maintenance circuits.

ACCESS

The CompuServe Network is available in more than 300 major cities (see Figure 1, Page OL20-178-202) by dialing a local CompuServe number. The CompuServe Network from Tymnet or Telenet provides access to an additional 300 dial-up cities not currently on the CompuServe Network. (A gateway is a service which enables data to pass between separate networks.) For international coverage, CompuServe Network provides a direct connection with the Canadian Datapac network for Canada, as well as access via RCA Globcom and ITT TeleCom for Europe, Asia, and many other parts of the world.

Network Access Rates
Domestic Public Dial-In Standard Rates

	Speed (bps)	Hours/Month	Rate/Hour ($)
Local Dial	110-2400	0- 750	3.75
		751- 1,500	3.25
		1,501- 2,500	2.80
		2,501- 4,000	2.40
		4,001- 5,000	2.25
		5,001-10,000	2.00
		over 10,000	1.50

Common Carrier Access Surcharge

All connect hours .... $0.25/hr.

Minimum connect time is one minute.

Domestic Transmission Charge

This rate applies to all data transmitted or received by the customer between CompuServe domestic network nodes.

Speed	Kilocharacters/ Month	Rate/ Kilocharacter
All Speeds	0- 50,000	0.050
	51,000-100,000	0.040
	101,000-250,000	0.030
	251,000-500,000	0.025
	over 500,000	0.015

Table 1. Domestic rate schedule.

CompuServe Network Control Center.

The network is used mainly to communicate with remote host computer systems via a terminal, a modem, and a local phone call into one of the network's MicroNodes. The most commonly used terminal is a full-duplex 300 bps, asynchronous, ASCII CRT, or teleprinter. Various terminals can, however, be used to access the network.

For dial-in connection, all standard asynchronous speeds from 10 to 240 cps (110 to 2400 bps) are supported. If terminals are hardwired to a node, asynchronous speeds of up to 14,400 bps are supported. CompuServe Network provides protocol conversion, error correction, and data security.

Customers' host computers are connected to the CompuServe Network via a dedicated communications line called a Synchronous Network Link. This line connects

OPA/Month	Rate/Month/OPA ($)	Overage Rate ($)
1-20	600	10/hr.
over 20	500	10/hr.
2400 bps Surcharge		6/hr.

Table 2. Open Port Arrangement pricing.

the host to the nearest public dial-in MicroNode. Hosts may be connected to the Synchronous Network Link in one of several ways.

Hosts with asynchronous communications are hardwired to a customer-dedicated MicroNode that serves as a front-end processor. This dedicated MicroNode can be connected directly to the Synchronous Data Link or indirectly through another customer-dedicated MicroNode. Synchronous hosts conforming to the CCITT X.25 protocol connect directly to the Synchronous Network Link. Hosts with bisynchronous communications, as exemplified by the IBM 3270 protocol, are provided with special 3270 emulation hardware and software and are also connected directly to the Synchronous Network Link.

RELIABILITY

CompuServe designs, assembles, and quality assures its own communications processor, the MicroNode. Through in-house production, CompuServe controls equipment supply and installation lead time. In addition, CompuServe also maintains complete control over software developments.

Each node in the network is reviewed regularly to determine its traffic volume. If traffic is deemed too heavy, additional lines and ports are installed. Each node is also equipped with its own uninterruptible power supply.

CompuServe's Network Control Center monitors all physical aspects of the network from the Columbus, Ohio facility 24 hours a day. The Network Control Center staff has the tools to analyze and correct any problems that arise remotely from the Columbus facility. CompuServe's geographically dispersed field engineers have the same capability through special dial-up diagnostics. According to CompuServe's statistics, better than 99.5 percent uptime has been achieved.

SECURITY

CompuServe's security measures include the following:

- Encryption of all passwords through a "one-way trapdoor" scheme.
- Privacy and autonomy for creation, deletion, and change of all user identification codes and passwords. This is accomplished through the CompuServe Host Administration Program (CHAP), which provides the user with complete control over this important function.
- Timeliness for all changes of identification and passwords. The system is updated each evening, giving multiuser, commercial customers the flexibility to invalidate users within hours.
- Restrictions and privileges can be set by geographic location and user ID, reducing the number of locations from which any unwanted access might occur.
- Automatic logout can be customer predetermined to occur after any number of invalid attempts.
- Security notices occur after several invalid attempts to connect with the host computer.

CompuServe provides passwords and user IDs of up to 24 characters in length, and they may include any number of uppercase and special characters. The customer is then responsible for maintaining and changing the passwords as frequently as necessary.

CUSTOMER SUPPORT

CompuServe's Network Control Center is staffed 24 hours a day, 7 days a week. Network problems are immediately flagged and most problems are solved remotely.

CompuServe Network provides all network users with an on-line assistance file with CompuServe phone numbers and backup numbers for its gateway services. The numbers can be searched by state or area code. The assistance file is menu driven for easy operation and also provides instructions for access, announcements of new phone numbers in the network, service bulletins, and a feedback section in which any user can send a message to report a problem or ask a question. This service is available at no additional charge.

PRICING

Network Access Rates

The minimum connect time on CompuServe's network is one minute. The highest hourly connect rate is $3.75 (see Table 1, Page OL20-178-203). Volume discounts are available for both time and character transmission. CompuServe also provides additional savings through one- and two-year, extended-term agreements.

Speed	Monthly Charge ($)	Installation Charge ($)
4800 bps	800	800
9600 bps	1,100	800
14,400 bps	1,500	800
Dial Backup: 4800 bps	200	200

A 4800 baud line may be upgraded to 9600 baud for a onetime fee of $200.

Table 3. Pricing for host connection.

CompuServe Network Services

> Open Port Arrangements (OPAs)

When usage reaches sufficient volume, customers may opt for OPAs in lieu of domestic public dial-in and domestic transmission charges (exclusive of WATS and gateway surcharges). OPAs provide fixed-rate access per simultaneous user of the customer's host computer through the CompuServe Network at 110 to 2400 bps. The minimum number of OPAs per customer host computer is five per month under a one-year minimum contract (see Table 2, Page OL20-178-204).

Host Synchronous Network Link

These rates include a dedicated synchronous connection into the CompuServe Network, a leased access line between the customer's premises and CompuServe's designated Network Node, required modems or digital interface units, and full-time maintenance. Optionally, customers may elect backup at the rates quoted in Table 3 (Page OL20-178-204). Telephone connect time incurred during the use of dial backup will be rebilled to the customer at the rate of $30 per hour.

CompuServe MicroNodes on the customer's site provide asynchronous host ports or terminal ports at speeds of 110 to 2400 bps. The MicroNode may be connected directly to the CompuServe Network via a Synchronous Network Link or indirectly through another of the customer's dedicated MicroNodes.

Asynchronous Connection Rates

The asynchronous rates include full-time maintenance and up to 15 feet of standard cables for each port when required. Telephone lines and equipment will be provided by CompuServe where required at 115 percent of the tariffs of the common carrier used. (See Table 4.)

Gateway Charge

Customers may access hosts on CompuServe via certain ports on selected other public networks for a surcharge of $3 per hour above CompuServe usage rates on Class A gateways, $6 per hour on Class B gateways, $1 per hour on Class C gateways, and $10 per hour on Class D gateways.

Dial IN-WATS Charge

Customers may dial IN-WATS into the CompuServe Network at 110 to 2400 bps for a surcharge of $19 per hour.

Domestic Private Access Ports

Private access ports are available for terminal users at $200 per month, with a $200 onetime installation fee, eliminating the hourly charges from these ports. The user can access these ports in two ways: on a dial-in basis, in which a private phone number is reserved for local users, or on a hardwired arrangement, in which the terminal is >

Asynchronous Connection Rates

Model	Max # Links	Max # Ports*	Monthly Charge ($)	Installation Charge ($)
MN08	1	8	250	700
MN20	2	20	800	700
MN40	2	40	1,300	700
MN60	4	60	2,000	700

**Not included in the MicroNode monthly or installation charges. Please see MicroNode Options.*

MicroNode Options

	Monthly Charge ($)	Installation Charge ($)
Async ports (set of 2)	70	*
Each additional Host Name	20	200

Nanonode prices include eight asynchronous ports.

Any MicroNode is field upgradable for a onetime charge of $500.

**If asynchronous ports are installed at the time of the MicroNode installation, the installation fee is $20 per pair: charges for subsequent installation of asynchronous ports are $100 for the first pair and $20 for each additional pair.*

Connection between Customer's Dedicated MicroNodes

	Monthly Charge ($)	Installation Charge ($)
Co-located	60	200
Distant	110	200

Co-located MNs must be no more than 50 feet apart. Distant MNs require dedicated circuits and modems (not included).

Synchronous Protocol Connection Rates

Protocol Conversion

Customers wishing to use synchronous 3270 Protocol will require a Synchronous Network Link plus a CompuServe Protocol Converter. Protocol converters must be on the customer site with a MicroNode or NanoNode. Charges below are per eight simultaneous users.

Monthly Charge ($)	Installation Charge ($)
500	500

X.25 Protocol

The X.25 Synchronous Protocol is available at the same rates as host Synchronous Network Links.

Table 4. Rates for asynchronous and synchronous protocol connections.

CompuServe Network Services

▷ connected directly to the CompuServe Public Dial-in MicroNode by a dedicated access line. The dedicated line and modems are charged at 115 percent of cost from third-party suppliers.

Extended-Term Agreements

CNS provides additional savings to the customer through extended one- and two-year agreements. Discounts of 5 percent to 15 percent are available based upon volume commitment and length of contract. Nondiscountable services include gateway surcharges, OPAs, WATS, special telephone equipment provided at 115 percent of common carrier tariffs, Synchronous Network Links, and monthly account charges.

Administration Rates

Various administration rates, including monthly account charges, user identification codes, and optional accounting charges, are also imposed by CNS. A summary of these charges is included in Table 5. ☐

Administration Rates	
Monthly Account Charge (includes hard copy of detailed connection report)	$100
Optional Accounting Tape	$100
CompuServe Host Administration Program (CHAP)	3 hr./month—no charge; over 3 hr./month—$40/hour
User Identification Codes	Up to 200—no charge; over 200—$50/100/month
Preinstallation Cancellation	$800
(In the event that customer cancels agreement after CompuServe's acceptance but before the actual installation occurs.)	

Table 5. Administration rates.

CompuServe Network Services

Asynchronous Connection Rates

Model	Max # Links	Max # Ports*	Monthly Charge ($)	Installation Charge ($)
MN08	1	8	250	700
MN20	2	20	650	700
MN40	2	40	1,300	700
MN60	4	60	2,000	700

**Not included in the MicroNode monthly or installation charges. Please see MicroNode Options.*

MicroNode Options

	Monthly Charge ($)	Installation Charge ($)
Async ports (set of 2)	70	*
Each additional Host Name.	20	200

Nanonode prices include eight asynchronous ports.

Any MicroNode is field upgradable for a onetime charge of $500.

**If asynchronous ports are installed at the time of the MicroNode installation, the installation fee is $20 per pair: charge for subsequent installation of asynchronous is $100 for the first pair and $20 for each additional pair.*

Connection between Customer's Dedicated MicroNodes

	Monthly Charge ($)	Installation Charge ($)
Co-located	60	200
Distant.	110	200

Co-located MNs must be no more than 50 feet apart. Distant MNs require dedicated circuits and modems (not included).

Synchronous Protocol Connection Rates

Protocol Conversion

Customers wishing to use synchronous 3270 Protocol will require a Synchronous Network Link plus a CompuServe Protocol Converter. Protocol converters must be on the customer site with a MicroNode or NanoNode. Charges below are per 8 simultaneous users.

Monthly Charge ($)	Installation Charge ($)
500	500

X.25 Protocol

The X.25 Synchronous Protocol is available at the same rates as host Synchronous Network Links.

Table 4. Rates for asynchronous and synchronous protocol connections.

surcharges). OPAs provide fixed-rate access per simultaneous user of the customer's host computer through the CompuServe Network at 110 to 1200 bps. The minimum number of OPAs per customer host computer is five per month under a one-year minimum contract (see Table 2, Page OL20-178-206).

Host Synchronous Network Link

These rates include a dedicated synchronous connection into the CompuServe Network, a leased access line between the customer's premises and CompuServe's designated Network Node, required modems or digital interface units, and full-time maintenance. Optionally, customers may elect backup at the rates quoted in Table 3 (Page OL20-178-206). Telephone connect time incurred during the use of dial backup will be rebilled to the customer at the rate of $30.00 per hour.

CompuServe MicroNodes on the customer's site provide asynchronous host ports or terminal ports at speeds of 110 to 2400 bps. The MicroNode may be connected directly to the CompuServe Network via a Synchronous Network Link or indirectly through another of the customer's dedicated MicroNodes.

Asynchronous Connection Rates

The asynchronous rates include full-time maintenance and up to 15 feet of standard cables for each port when required. Telephone lines and equipment will be provided by CompuServe where required at 115 percent of the tariffs of the common carrier used. (See Table 4, Page OL20-178-207.)

Gateway Charge

Customers may access hosts on CompuServe via certain ports on selected other public networks for a surcharge of $3.00 per hour above CompuServe usage rates on Class A gateways, $6.00 per hour on Class B gateways, $1.00 per hour on Class C gateways, and $10.00 per hour on Class D gateways.

Dial IN-WATS Charge

Customers may dial IN-WATS into the CompuServe network at 110 to 2400 bps for a surcharge of $19.00 per hour.

Domestic Private Access Ports

Private access ports are available for terminal users at $200 per month, with a $200 onetime installation fee, eliminating the hourly charges from these ports. The user can access these ports in two ways: on a dial-in basis, in which a private phone number is reserved for local users, or on a hard-wired arrangement, in which the terminal is connected directly to the CompuServe Public Dial-in MicroNode by a dedicated access line. The dedicated line and modems are charged at 115 percent of cost from third-party suppliers.

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Administration Rates

Monthly Account Charge	$ 100
(includes hardcopy of detailed connection report)	
Optional Accounting Tape	$ 100
CompuServe Host Administration Program (CHAP)	3 hr./month—no charge; over 3 hr./month—$ 40/hour
User Identification Codes	Up to 200—no charge; over 200—$50/100/month
Pre-Installation Cancellation	$ 800
(In the event that customer cancels agreement after CompuServe's acceptance but before the actual installation occurs.)	

Table 5. Administration rates.

▷ Extended Term Agreements

CNS provides additional savings to the customer through extended one- and two- year agreements. Discounts of 5 percent to 15 percent are available based upon volume commitment and length of contract. Non-discountable services include gateway surcharges, OPAs, WATS, special telephone equipment provided at 115 percent of common carrier tariffs, Synchronous Network Links, and monthly account charges.

Administration Rates

Various administration rates, including monthly account charges, user identification codes, and optional accounting charges, are also imposed by CNS. A summary of these charges is included in Table 5 (Page OL20-178-208). ☐

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Control Data Corporation

Control Data Corporation (CDC), a *Fortune* 500 company, provides value-added products and services based on computer technology. The company was established in 1957 to design and manufacture mainframe computers for scientific and engineering applications. Since then, Control Data has expanded into other areas including marketing information and information retrieval services.

This report focuses on the information services offered by Control Data's Business Services Group. This group provides marketing information, business management, and financial information services. Also profiled are Arbitron Ratings Company and SAMI/Burke, Inc., which provide marketing information services. Control Data Business Centers and Quorum Systems supply business management services. Financial information services are marketed through Credit Union Services, Action Data Services, and Micrognosis.

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COMPANY INFORMATION

Control Data Corporation
8100 34th Avenue South, Box O
Minneapolis, Minnesota 55440
Telephone (612) 853-8100

Company Background

Control Data Corporation (CDC), a computer industry leader, was founded in 1957. The company initially designed and manufactured computers for markets with complex computing requirements. Today it offers a variety of computer products and services for scientific, engineering, and business applications. Control Data has operations in nearly 50 countries and approximately 34,000 employees. Its 1987 revenues totaled $3.4 billion.

Between 1985 and 1987, Control Data underwent a major restructuring—selling or closing approximately a dozen businesses and product lines to concentrate on computer products and services. In September 1988, Control Data made its Data Storage Products Group a separate subsidiary known as Imprimas Technology, thus allowing management to focus more on systems and services. Examples of how Control Data's strategy is paying off follow:

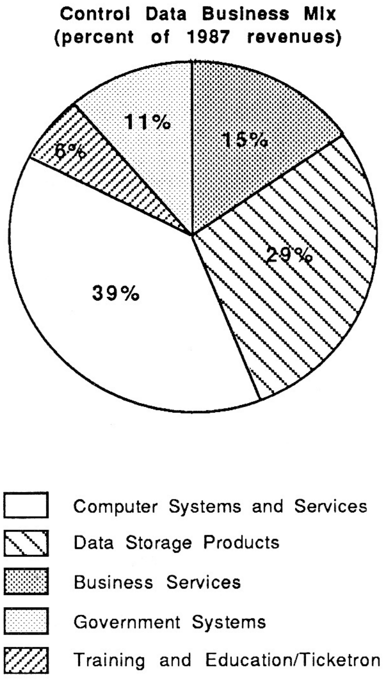
Control Data Business Mix
(percent of 1987 revenues)

Figure 1. Control Data's revenues, by business, for 1987. The Business Service Group, the focus of this report, had 1987 revenues of more than $500 million. Control Data plans to increase this group's size dramatically by 1990.

- With the acquisition of SAMI/Burke, Inc., in late 1987, Control Data became one of the largest full-service marketing information resources for advertisers and the media. Arbitron Ratings Company measures what TV and radio audiences watch, and SAMI/Burke tracks what they buy.

- Control Data increased its interest in Micrognosis Inc. to 97 percent. Micrognosis, which provides integrated trading systems to financial institutions, has a strong international financial market presence.

- Ticketron has fortified its leading automated wagering market position by obtaining the new Florida lottery contract and renewing its Pennsylvania lottery contract.

- ETA Systems, the supercomputer subsidiary Control Data established in 1984, offers a full product range, from the first supercomputer priced under $1 million, to the world's most powerful supercomputer.

- Control Data has completely upgraded its CYBER mainframe line, including 13 new models introduced during the first half of 1988. The line's top machine is 30 times more powerful than the entry-level model, and all models have the same operating system. The company is developing a Transparent Computing Environment that combines different sizes of computers from

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Control Data Corporation

▻ multiple vendors and puts them on desktops as one logical computer.

- In government defense, Control Data is the premier supplier of three standard government products: the Navy's AN/AYK-14 airborne computer, the M-1 tank's fire control computer, and the UYN-3 Navy Standard disk. A recent contract award for the U.S. Air Force's Advanced Tactical Air Reconnaissance System is a significant step in expanding Control Data's business as a prime contractor in electronic systems integration.

- Imprimas Technology is the leading worldwide supplier of high-performance disk drives to the OEM industry. Control Data claims it has the broadest product line with disk drives ranging from 3.5 inches to 14.0 inches, with three quarters of its products introduced during the past three years.

Control Data's on-line data service components include the following:

Scientific Information Services (SIS)—provide supercomputer time-sharing services. It was formed when Control Data combined United Information Services with its CYBERNET remote computing services.

Arbitron Ratings Company—the largest U.S. audience measurement service and the only one to monitor both radio and television. Customers can access and interpret data electronically.

SAMI/Burke—offers marketers of packaged goods comprehensive data on product movement, as well as applications for and decision-support to access and manipulate that data.

Business Management Services (BMS)—provides payroll processing, tax filing, human resources management systems, and accounting services to more than 15,000 U.S. customers.

Business Services Group—supplies decision-support software and services to *Fortune* 500 companies in the transportation and travel industries. It also supplies comprehensive software and services for investment management, commercial paper issuance, and management reporting.

Quorum Systems—provides litigation support services and office automation systems tailored specifically to the legal profession.

Micrognosis—supplies automated systems to brokers and traders worldwide, and also markets systems that simplify brokers' access to Telerate, Quotron, and other financial information services.

Control Data also provides a full line of loan and deposit accounting and financial reporting applications to credit unions, banks, savings and loans, thrifts, and consumer credit companies.

Competitive Position

Control Data reports a number one or number two position in most of its services businesses. The combined services of Arbitron Ratings Company and SAMI/Burke make it one of the largest marketing information services providers. Business Management Services, Micrognosis, and Credit Union Services are other service businesses that enjoy market leadership positions.

Control Data feels its Computer Products business has the industry's broadest product line, offering workstations, mainframes, and supercomputers, and information management and development tools and integrated applications. The company's ETA10 supercomputers are reportedly the world's most powerful. Also, Control Data is one of the largest third-party maintenance suppliers.

Imprimas Technology, a Control Data subsidiary, is the leading provider of high-performance, high-capacity data storage products to the OEM industry.

RESOURCES AND FACILITIES

BUSINESS SERVICES GROUP

Processing Centers

The Business Services Group maintains computer centers in Cleveland, Ohio and Campbell, California. BIS uses IBM Series 30XX mainframes, as well as several IBM System 43XX and Wang VS 100 systems to accommodate the remote computing services generated from these two centers.

Systems Software

Control Data's Business Services Group runs its own proprietary operating system as the host to the application systems, software packages, and databases that represent the majority of client usage. In addition, to meet certain specialized client needs, this Group also provides IBM operating systems, including OS/VS2, MVS/SP3, JES2, and TSO. Available programming languages include Assembler, Cobol, Fortran, PL/1, and Basic.

Business Services Group provides systems software for the following major areas:

- Database management, inquiry, and reporting

- Planning analysis and modeling
- Graphics
- Management science (time series analysis and forecasting, risk analysis, and statistical analysis)
- Proprietary database access and reporting

The cornerstone of Business Services Group's software capabilities is a fourth-generation and relational database facility called X/L. X/L is the latest and most advanced system developed by this Group for database management. This product provides reporting, information handling, inquiry, and maintenance capabilities.

Customer Support

Business Services Group maintains its high level of client support and assistance by using trained system specialists. These specialists help clients develop, maintain, and enhance their systems. Other support services include:

- On-line bulletins and documentation
- Comprehensive system guides, product reference manuals, and user guides
- Product- and industry-specific seminars
- 24-hour hot line access for system and product questions
- Vendor support and consulting services

Sales and Marketing Services

Business Services Group markets its services through a worldwide marketing organization. More than 500 employees are involved in the 24-hour maintenance and operation of its development laboratories, operation centers, and network operations.

INDUSTRY-SPECIFIC SERVICES

THE ARBITRON RATINGS COMPANY

Broadcasting

Arbitron Ratings, a division of CDC's Business Services Group, provides on-line access to databases containing information on radio and television broadcast measurement for subscribing radio stations, television stations, advertisers, and advertising agencies. The databases contain quantitative information from sources such as demographic, sex, and age groups. Arbitron Ratings measure 212 television and 261 radio markets nationwide by contacting and interviewing more than 1.5 million families annually. The Arbitron Ratings Company offers three on-line services—two services on Arbitron Information on Demand (AID), and Arbitrends, computer-delivered market information.

The two AID services each serves its respective radio and television industry segment. The *Radio AID System* helps users evaluate the radio market, examine audience responses, and analyze the competition's audience. It also helps radio station managers and advertising agencies design marketing areas to examine each station's performance within custom time periods based on quarter-hour to 24-hour periods, overnight listening or month by month; select custom geographies using counties and zip codes; examine factors such as away-from-home listening; select specific demographics such as working persons; analyze ethnic/nonethnic audience composition; determine audience duplication and shared listening on a station-by-station basis; and evaluate special broadcasts. Arbitron provides a Radio Programmer's Package as part of the AID system. This package provides 11 programming insight reports on a station's listeners.

The *Television AID System* provides media directors, television station managers and programmers, research directors, planners, buyers, and advertising managers with reported viewers' information. This information can be used for business presentations, pre- and postbuy analyses, market planning, budget allocations, and client presentations. The television system, which offers many of the radio system's services, can also determine cable's impact on television viewing and examine audience viewing peaks and valleys. Customers using USAID, a part of the Television AID System, can access national audience estimates for specific television programs. Currently, this database includes diary information from approximately 5,000 television households. Also available with the television system is *ClusterPlus*, a geodemographic viewer profile system. ClusterPlus targets audiences according to zip code clusters, representing up to 40 different income/ethnic/life-style groupings.

Arbitron's *Target AID* is a direct access service that uses geodemographic cluster data (ClusterPlus and Prizm) to profile audiences by life-style. With this service, broadcasters and advertisers can select the television program, day part (viewing period), or station that appeals to consumers most likely to purchase various products, and develop advertising schedules that reach viewers with desirable buying habits.

Product Target AID is used by television stations to design the ideal advertising schedule for potential advertisers. This service uses ClusterPlus, Simmons Market Research Bureau Product User Profiles, and AID to match the life-style profile of audiences for everyday part and TV program in a market, and the life-style profiles of proven users for 200 heavily advertised products and services.

Control Data Corporation

Arbitrends computer-delivered market information is available for radio and television subscribers. Radio Arbitrends provides quarterly Radio Market report updates in the form of three-month rolling average reports. Television Arbitrends, available in selected markets, provides subscribers with daily local television audience estimates by household, based on electronically monitored television set usage in hundreds of randomly selected households in the subscriber's Area of Dominant Influence (ADI).

The company is also involved in Scan America, which provides electronically gathered television-viewing data from individuals with product-purchase data from the individual's household.

SAMI/Burke

SAMI/Burke resulted from the 1986 merger between Selling Areas Marketing Inc., a syndicated packaged goods tracking service, and Burke Marketing Research, the world's largest custom market research firm. Control Data purchased the SAMI/Burke marketing research organization from Time, Inc. in January 1988.

SAMI/Burke tracks consumer products sales, conducts electronic test marketing, and offers a wide range of analytical services and consulting expertise. SAMI gathers this information for packaged goods companies by tracking retail sales, warehouse withdrawals, and weekly sales of supermarket items through scanner-equipped stores.

SAMI's *SAMSCAN* service provides packaged goods manufacturers with weekly scanner-generated sales of UPC symbol market items in selected supermarkets in 47 major markets, covering 67 percent of total food sales. SAMSCAN reports 500 categories including nonwarehoused items such as soft drinks, snacks, beer, and ice cream. Causal databases such as display activity, retailer newspaper ads, coupons, and other merchandising activities are included.

Among SAMI's many other services is *DecisionMaster*, an optical disk-based decision support system with integrated databases that provide marketers with a system for developing efficient and effective marketing plans.

The *SAMI Scan Service* allows clients to obtain information within 48 hours for any of SAMI's categories, classes within categories, brands, and items, through on-line access to its data file.

Market Metrics' *SUPERMARKET SOLUTIONS* is offered by SAMI through an exclusive agreement with Market Metrics, Inc. This system of services and databases provides information on sales, shopper demographics, and stores—including location, square footage, and format—for every U.S. supermarket with sales of $2 million or more. This database can be linked to SAMI volumetric data, to trade promotion tactics, and for distribution pattern evaluation.

NETWORKING SERVICES

BUSINESS SERVICES GROUP

Control Data's network is accessed through a variety of devices, including ASCII terminals, microcomputers, 3270-type terminals, RJE terminals, and IBM mainframes. The company's international communications network services the U.S., Canada, Europe, and the Far East.

The network provides the infrastructure to Control Data's computer-sharing, software-sharing, and database-sharing services.

ON-LINE DATABASES

The following databases are examples of the many offered on-line by Business Services Group. Other databases are available for special purposes, and Control Data is continuously adding new files to the service.

Financial

EURABANK—a database system provided by Sleigh Corporation, Franklin Lakes, New Jersey. The database contains financial information based on the fiscal year-end annual report statements of 2,000 non-U.S. banks in more than 100 countries. This current information provides the database with statements from the most recent five years of representative banks from all worldwide banking centers.

FINEC—a financial service offered in conjunction with Money Market Services (MMS). Reporting on all aspects of the money market, FINEC consists of weekly historical analyses; dealer surveys (both foreign and domestic); forecasts; and daily comments by Robert A. Jones, chairman of the board of MMS. Also included is an historical database that consists of the series relating to financial markets and financial futures.

MBAccess—contains information from the Government National Mortgage Association on pooled, mortgage-backed pass-through securities. More than 70,000 issues exist, and the number is constantly growing. GNMA, FNMA, and FHLMA security holders can gain accurate and timely access to more than a dozen items of information on each pool. Multiple analytical tools are also available.

Control Data Corporation

> Investment

MISTI II—a securities database using information provided by IDSI, consisting of daily price and historical information on over 65,000 stocks, bonds, and options traded on major U.S. and Canadian exchanges. Each record contains 65 fields of relevant information, some of which are updated daily to reflect market activity and other timely changes.

MUNIPRICE—a database provided by IDSI that contains prices for issues placed by more than 36,000 municipal bond issuers.

VALPORT—a database provided by Frederic C. Towers as a part of the VALPORT Portfolio System. It contains prices, earnings, dividends, and other statistical information on over 65,000 securities. The database, updated daily, includes recent daily price histories and monthly closing prices for the previous year. Over 6,500,000 items of information are available on-line for statistical research and automatic portfolio valuation.

Marketing

X/MARKET—a database and reporting system that contains information on 450,000 U.S. business establishments with 20 or more employees. The data is provided by Trinet. Each establishment record includes the following data: establishment name, address, and zip code; county; telephone number; four-digit SIC code number; the number of employees; and sales figures. The database can be used in conjunction with market potential indices developed by the user or by Trinet to establish market potential or market penetration.

AmericanProfile—an information retrieval system that allows businesspersons, administrators, planners, and researchers to access demographic and economic information by combining selected public data resources with data available solely through companies of The Dun and Bradstreet Corporation. AmericanProfile includes five large proprietary databases:

- Demographic
- Economic
- Coordinate Reference
- Geographic Centroid
- Market Potential Service

Any geographic area of interest in the U.S. can be defined quickly and easily, and the information displayed in a variety of formats and forms of output. Demographic reports provide a comprehensive socioeconomic picture, including the ability to detail the demographic clusters constituting a specific area. Economic reports complement the demographic profiles by describing the commercial environment. Geographic reports display all of the geographic units in the market area, including census tracts, minor civil divisions, or zip codes. The comparison, contrast, and columnar reports provide information about two or more areas simultaneously in a single, concise format.

Health Care Marketing System (HCMS)—HCMS consists of eight databases:

- Hospital
- Nursing Home
- Nonhospital Clinical Laboratories
- Multihospital System and Group Purchasing Organizations
- Health Maintenance Organizations
- Freestanding Outpatient Surgery Centers
- Minor Emergency Centers
- Home Health Agencies

The databases can be viewed from different perspectives including region, facility type, LOS, number of beds, etc.

OTHER SERVICES

Computer Systems and Services

Control Data's Computer Systems and Services Group provides a complete line of computer products and associated services. Customers of these products are in global scientific and engineering markets and in other markets with similar complex computing requirements.

The Group is engaged in three businesses: computers, third-party engineering services, and systems integration. Computer Systems and Services designs, manufactures, and markets Control Data's CYBER line of high-performance workstations and mainframe computers, information management and development tools, and integrated applications. Computer Systems also offers supercomputer services to a wide range of users.

In addition to the wealth of computing resources provided by its CYBER, IBM, and Cray computer mainframes, Control Data's SIS Group offers a wide range of proven third-party and proprietary software packages. These are designed to address the needs of the electric utility, electronics, petroleum, aerospace, and manufacturing industries and the government. ▷

Control Data Corporation

⊳ Training and Education

Control Data's PLATO system, which incorporates hardware, software, and "courseware," has, according to the company, proven itself in several industries as an effective, efficient, and flexible way to train employees. PLATO trains electric utility dispatchers, nuclear plant operators, and stockbrokers, and everyone from airline pilots and maintenance personnel to industrial factory workers in the use of new equipment.

Technical Support

Control Data's Technical Support Services provide customers with a wide range of consulting, training, and computer maintenance solutions. Maintenance services provide comprehensive hardware maintenance for Control Data, IBM, Digital Equipment Corporation, and other manufacturers' computers. Control Data is one of the three largest computer maintenance services organizations in the world and, according to the company, is the only one providing complete services from microcomputers to supercomputers.

Ticketron

Ticketron provides computerized lottery services to the states of Florida, New York, Illinois, Maryland, Pennsylvania, Washington, and Delaware, and two offtrack betting systems in New York. Ticketron also supplies an on-line ticketing system in the United States and Canada that links customers to sports and other entertainment events, and to national and various state park systems. In 1987, Ticketron's revenues exceeded $120 million. □

DRI/McGraw-Hill

COMPANY INFORMATION

DRI/McGraw-Hill
24 Hartwell Avenue
Lexington, MA 02173 (617) 863-5100

UPDATE: *Since our last update in April of 1988, there have been some significant developments. DRI became part of the McGraw-Hill Financial Services Company, one of three divisions comprising McGraw-Hill Inc. DRI/McGraw-Hill was formed in 1988, consisting of two businesses, Data Resources and Compustat. The new group leverages the strengths of the two businesses to create a leading provider of information, data analysis and software to corporations, international customers, financial institutions, government, and other markets. DRI added several new on-line databases, including DRI International Oil, DRI U.S. and Canadian Equities, DRI U.S. Bonds, and ScotiaMcLeod Canadian Fixed Income. DRI has not only developed new on-line services, it has widened the scope of coverage for its worldwide econometric models.*

Company Background

Founded in 1968 by well-known economist Otto Eckstein, DRI provides economic databases, econometric models, and related consulting services to industry and government clients worldwide. The largest company of its kind, DRI now has more than 1,000 client organizations worldwide.

DRI became a publicly held corporation in 1976. McGraw-Hill, Inc. acquired DRI in 1979, and since then, DRI has acquired London-based Economic Models Limited, an economic information company. McGraw-Hill reorganized its divisions along market focus lines in 1985. DRI was moved into FEICO, the newly formed Financial and Economic Information Company. As part of this change, roughly 20 percent of DRI's business was moved into other market focus groups within McGraw-Hill. In 1988, DRI became part of the McGraw-Hill Financial Services Company, one of three divisions comprising McGraw-Hill.

DRI employs approximately 600 people, supporting 1989 revenues of $65 million. More than 500 of DRI's employees are economists, client consultants, and software and data specialists.

DRI offers a vast array of on-line economic and financial databases. In some cases, coverage is broad, embracing national and international economic and financial indicators useful in such areas as corporate and investment planning and policy analysis. Other DRI databases provide in-depth coverage of specialized industrial or financial sectors, such as banking, transportation, health, and energy.

DRI/McGraw-Hill, a McGraw-Hill subsidiary formed in 1988, is a combination of two businesses: Data Resources and Compustat. Data Resources provides economic forecasting and information services, while Compustat offers a financial database containing detailed information on more than 7,000 publicly traded companies. Founded in 1968, DRI offers one of the largest collections of numeric data on-line. This data includes more than 125 historical and forecast databases, which are used by more than 1,000 industrial, financial, and government organizations worldwide. DRI's data services are combined with local user-supplied information for manipulation, analysis, and reporting.

DRI has also developed advanced reporting, graphing, modeling, and decision support system implementation tools to make data accessible to its clients in ways directly related to their interests. These tools incorporate the functions most often invoked in financial reporting, econometric modeling, policy analysis, and corporate planning. Delivery methods include time-sharing and distributed processing, either with multiuser systems or via personal computers. The complementary strengths of these two companies gives DRI/McGraw-Hill leverage to make itself a leading provider of information, data analysis and software to financial institutions, corporations, government, international customers, and other markets.

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DRI's clients use these databases to perform their own analyses; it also furnishes the necessary input to DRI econometric and financial models. DRI has developed national or regional econometric models for the following areas:

- United States
- Canada
- Japan
- Germany
- France
- United Kingdom
- Italy
- The Smaller Western European Countries
- Eastern Europe (developed by Plan Econ, Inc.; marketed by DRI)

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DRI/McGraw-Hill

- East Asia
- Latin America
- The Middle East
- Africa

DRI maintains an extensive database (over 30 million time series) of historical information and forecasts concerning major industrial and financial sectors of the U.S. and world economies. In addition, DRI provides a variety of specialized econometric models, including:

- Agriculture
- Automobiles and trucks
- Chemicals
- Coal
- Construction
- Defense
- Drilling
- Electricity
- Energy
- Steel
- Transportation
- Utilities

Monitoring and projecting the behavior of industrial sectors shows only a part of the world's economic system. For tracking the financial markets, DRI provides databases and analysis packages for the following areas:

- Investment research and analysis
- Money markets
- Fixed income
- Equity research
- Industry finance

DRI also offers cross-industry models with specialized purposes, but broad applications. These include:

- Market planning
- Cost forecasting
- Country monitoring
- Foreign trade
- Income distribution
- Input/output
- State and area forecasting

DRI produces many publications that review and evaluate the results of the execution of these models. DRI economists, working with these models and the databases that support them, hold periodic conferences to discuss the economic outlook in detail for regions, nations, and industries.

Through several personal computer, software packages, DRI clients have access to historical and forecast information and to many of DRI's models.

Competitive Position

The world's largest economic information consulting firm, DRI serves more than 1,000 clients in business, finance, and government. DRI/McGraw-Hill consists of two businesses: Data Resources and Compustat. The company leverages the strengths of the two businesses to create a leading provider of information, data analysis, and software to corporations, international customers, financial institutions, government, and other markets.

DRI/McGraw-Hill's primary competitor is The WEFA Group, the company resulting from the merger of Chase Econometrics and Wharton Econometric Forecasting Associates. While most of WEFA's databases come from the Chase Econometrics side, the former Wharton segment contributes important international trade data. DRI now also considers I.P. Sharp Associates Limited, a Reuters Company, a competitor, especially in the macroeconomic forecasting area.

DRI is still aggressively pursuing the PC market. It has introduced many PC-based software products, each designed to address a specific business problem. DRI's model of the U.S. economy, which is made up of 1,200 interlocking mathematical equations that simulate the nation's economy in action, has also been adapted for personal computers. The company offers front-end packages (e.g., PC*Gateway, and DRI/ACCESS) for downloading DRI or client data from DRI's mainframe computer and for accessing popular mainframe applications and selected PC products. A new application, Energy Data Access System (EDAS), offers functions that are similar to DRI's other front-end package applications. (Approximately 75 percent of DRI's subscribers that use a front-end use PC*Gateway.)

DRI also offers EPS/VM, a version of its proprietary EPS mainframe analytic software for use on in-house IBM computers. In addition, DRI has a personal computer version of EPS, called EPS/PC, which provides many of the data management, analytical, and information display features of mainframe EPS, including time series data management, regression analysis, seasonal adjustment, model building and simulation, report writing, and graphics.

Thanks to these innovations, DRI's reach is expanding beyond its traditional client base of professional economists and analysts and reaching further down to line management.

RESOURCES AND FACILITIES

Processing Center

DRI uses a Unisys A17 computer located in Lexington, Massachusetts. The system operates under the Unisys Master Control Program (MCP) operating system. The system interface is the Command and Edit (CANDE) terminal control program. Most users, however, use DRI's EPS and other integrated application systems such as TEXT, ABSTRACT, and Retrieve.

DRI/McGraw-Hill

Executive Offices and
Main Computer Operations

24 Hartwell Avenue
Lexington, MA 02173
(617) 863-5100

Regional Offices

4170 Ashford-Dunwoody Road
Suite 420
Atlanta, GA 30319
(404) 252-0626

625 N. Michigan Avenue
Chicago, IL 60611
(312) 440-2400

333 Clay Street
Houston, TX 77002
(713) 658-9261

3333 Wilshire Boulevard
Los Angeles, CA 90010
(213) 480-5270

11 Broadway
New York, NY 10004
(212) 208-1200

1234 Market Street
Philadelphia, PA 19107
(215) 496-4970

44 Montgomery Street
San Francisco, CA 94104
(415) 956-4050

777 Long Ridge Road
Stamford, CT 06902
(203) 329-2567

1750 K Street, NW
Washington, DC 20006
(202) 663-7600

International Offices

DRI Europe, Inc.
Avenue Louise 221
Boite 5
B1050 Brussels, Belgium
(322) 648-5445

DRI Europe, Inc.
Liebigstrasse 19
6000 Frankfurt 1
Federal Republic of Germany
(49-69) 720935

DRI Europe, Ltd.
30 Old Queen Street
St. James's Park
London SW1H 9HP England
(441) 222-9571

DRI Europe, Inc.
Via Santa Tecla, 2
I-20122 Milan, Italy
(392) 801088

DRI Europe, Inc.
13 Rue Quatre Septembre
75002 Paris, France
(331) 4260-3700

DRI Canada
250 Bloor Street, East
Suite 405
Toronto, Canada M4W 1E6
(416) 961-9323

Representatives

Dataline Ltda.
Rua Marques De Itu 58, 6B
01223 Sao Paulo SP Brazil

Dr. Ming-Yih Liang
Institute of Economics
Academica Sinica, Nankang
Taipei, Taiwan 11529

Steimatsky Information Systems
64 Hey Bieyar Street
Tel Aviv 62198 Israel

Nihon Keizai Shimbunsha
1-9-5, Ohtemachi
Chiyoda-ku, Tokyo 100, Japan

Economia, Ingeneria y
Sistemas c.a.
Centro Plaza
Torre B, Piso 16
Caracus, Venezuela
(582) 283-2411

Table 1. DRI office locations.

Systems Software

Operating Systems: DRI uses the Unisys MCP operating system. MCP controls resource allocation for more than 150 concurrently executing user programs on each system. The operating environment includes a full set of language processors, file management utilities, and resource allocation and monitoring facilities.

Some DRI users interact with DRI services through the CANDE terminal interface program. CANDE is a message control system that lets DRI users at remote terminals initiate and schedule programs, enter data, compile programs, and issue commands to access DRI's many application packages and databases. Typically, users sign on to the system through CANDE, which then carries out security verification. The user then enters a command to begin executing a DRI application program or a user-developed system.

The Remote Job Entry (RJE) system permits the introduction of programs and data from the remote job entry station and output on remote line printers at DRI regional offices or the client's locations. All of DRI's software can be accessed by ASCII terminals or by personal computers.

Data and Database Management: The DRI system supports database management facilities for retrieving, updating, and controlling its economic and financial databases and creating and maintaining of user databases. This database management system is optimized for handling time series and mixed time series cross-sectional data.

Proprietary DRI modeling and high-level languages contain routines designed to provide simple access to time series databases. DRI also provides interfaces to the time series databases from packages such as EPS and from standard procedural programming languages such as Fortran.

Languages: Much of the user programming done on the DRI system is written in one of the language facilities such as EPS, Model, or Retrieve. Of the standard industry-wide computer languages, DRI systems support Algol, Text, Retrieve, and Fortran.

Customer Support Services

DRI employs 300 consultants located in 10 U.S. and 6 foreign cities. They help clients in the daily use of DRI models, databases, and computer resources. They also are the link between clients and DRI economists, industry experts, and software specialists. DRI also maintains toll-free consulting services in New York for financial and industry clients nationwide.

In addition, DRI consultants conduct research projects for clients involving more specialized use of DRI services. These consultants might, for example, analyze in detail an industry or assist in building a general forecasting model for a client company.

The DRI educational program is designed to familiarize new clients with the DRI system through courses on the use of EPS.

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U.S. ECONOMICS

National

DRI U.S. Central
DRI U.S. News Service
DRI U.S. Prices
DRI U.S. Quarterly Model History
Flow of Funds
McGraw-Hill News

Regional

DRI/NPDC Census
DRI/NPDC County Business Patterns
DRI U.S. County
DRI U.S. Regional
SUPERSITE

Forecasts

DRI Business Fixed Investment Forecast
DRI Consumer Markets Forecast
DRI County Forecast
DRI GDP by Industry Forecast
DRI Housing Forecast
DRI Metropolitan Area Forecast
DRI Plant & Equipment Expenditures Forecast
DRI Regional Model Forecast
DRI U.S. Annual Model Forecast
DRI U.S. Quarterly Model Forecast

INTERNATIONAL ECONOMICS

Economies

Cansim Mini Base
DRI Canada Primary Source
DRI Canadian Quarterly Model History
DRI Current Economic Indicators
DRI Developing Countries
DRI Europe
NIKKEI Macro Economic Statistics
OECD Main Economic Indicators
OECD National Accounts

Trade and Finance

DRI ITIS Detailed Monthly Trade Monitor
DRI ITIS Trade Series C
IMF Direction of Trade
IMF International Financial Statistics

Forecasts

DRI Asian Forecast
DRI Canadian Quarterly Model Forecast
DRI Canadian Regional Forecast
DRI European Forecast
DRI Japanese Forecast
DRI Latin American Forecast
DRI Middle East and African Forecast
DRI/TBS World Sea Trade Forecast
DRI World Forecast
DRI World Trade Forecast

ENERGY

Industry

DRI Energy

Gas

DRI Natural Gas Spot Prices

Oil

DRI International Oil
Platt's Oil Prices

Forecasts

DRI Canadian Energy Forecast
DRI Coal Forecast
DRI European Energy Forecast
DRI Natural Gas Forecast
DRI Oil Spot Market Forecast
DRI U.S. Long-Term Energy Forecast
DRI U.S. Short-Term Energy Forecast
DRI World Oil Forecast

FINANCIAL

Capital Markets

AIBD Eurobonds
DRI Commodities
DRI Financial and Credit Statistics
DRI U.S. and Canadian Equities
DRI U.S. Bonds
ScotiaMcLeod Canadian Fixed Income

Performance

DRI Financial Market Indexes
Morgan Stanley Capital International Indexes
Russell Equity Indexes
Securities Industry Association
Standard & Poor's Industry Financial

Firms and Accounts

COMPUSTAT
Financial Post Investment
NIKKEI Corporate Financials

INDUSTRIAL

All Industries

DRI CIS Cost and Industry
DRI European Sectoral
TRINET Company
TRINET Location

Agriculture and Chemicals

DRI Agriculture
DRI Chemical
Platt's Chemical Prices

Construction

Dodge Building Stock
Dodge Construction Analysis System
Handy-Whitman Index
Dodge/LSI

Defense

BUDGETRACK/Congressional Status
CBD Plus
Congressional Testimony
Defense-Net
DRI Federal Contract Announcements

Table 2. Databases accessible through DRI.

DRI Federal Contract Awards
Forecast International Online
Program Element/Contract Number Transfers
Program Element Description Summaries

Forestry, Wood, and Wood Products

Random Lengths
RISI Forest Products
RISI Pulp and Paper

Metals

DRI Steel
Metals Week

Transportation

Automotive News
DRI International Auto
DRI International Truck
DRI Transportation
DRI Transportation Detail

Forecasts

Dodge Construction Market Forecast
Dodge Real Estate Analysis & Planning Forecast
DRI Chemical Forecast
DRI EstiMarket Forecast
DRI European Sectoral Model Forecast
DRI European Truck Forecast
DRI Freight Transportation Forecast
DRI Health Care Cost Forecasting
DRI International Cost Forecasting
DRI International Passenger Car Forecast
DRI/J.D. Power Light Vehicle Forecast
DRI/J.D. Power OEM Auto Supplier Forecast
DRI Long-Term Industry Forecast
DRI Metropolitan Area Industry Forecast
DRI North American Commercial Truck Forecast
DRI Quarterly Industry Forecast
DRI Regional Industry Forecast
DRI Steel Forecast
DRI Transportation Cost Forecasting
DRI U.S. Cost Forecasting
DRI Utility Cost Forecasting

Table 2. Databases accessible through DRI. (Continued)

Sales and Marketing Services

The DRI executive offices and computer center are in Lexington, Massachusetts. As shown in Table 1, DRI also has nine regional offices in the United States, six international offices, and representatives in five other countries.

APPLICATION-SPECIFIC SERVICES

The DRI system organizes, processes, and presents data to solve management problems, whether those problems involve short-term analysis of a small industry sector or a vast simulation of the major economies of the world.

EPS

EPS is a decision support tool that lets users handle data management, report writing, graphics, estimation, analysis, modeling, and array handling. They can generate reports and graphs using simple, English-language commands, providing nontechnical users with access to the data in both output formats. Brief summaries of EPS' capabilities follow.

Data Management. EPS data banks can store any object used by EPS: time series, array, vector, matrix, scalar, routine, stublist, template, interval, etc. Users knowing the object's name can store or retrieve data. Time series are automatically adjusted for frequency, intervals, unavailable data, conversion, distribution, etc.

Report Writing. A comprehensive PRINT statement with a full set of options provides the basic report writing capability; arrays are printed in what DRI says is an understandable and legible format. Users can generate more complex reports by invoking the WRITE command, which permits programmatic control of every report location. Reports can be created automatically (by specifying the rows and, optionally, the column definitions) or directly (by entering the rows and columns explicitly).

Graphics. EPS incorporates two graphics commands that are analogous to PRINT and WRITE. The PLOT command produces direct line and bar charts with a full range of options, allowing complete user specification of the plot. The DEPICT command allows the user to create a plot much like a report, with full user control over every point on the chart. A set of EPS routines, known as the *EPS Chart Package*, provides an easy user interface to many plotting capabilities. It supports virtually all plotting devices.

Estimation. In addition to linear regression, EPS includes commands for the following estimation techniques: two-stage least squares, instrumental variables, auto regression corrections, polynomial and Shiller distributed lags, ride regression, and nonlinear regression. Also available are full univariate ARIMA estimation and modeling. Regression variables can be time series, vector, or expressions. All estimation results are saved in synopses, which can be stored and later displayed.

Analysis. EPS' report writing, graphics, and estimation capabilities combine with statistical capabilities to support data analysis in all forms. All standard statistical functions are available, as is a full complement to analytical routines.

Modeling. To build a model, users provide a list of included equations. These equations can be nonlinear and handle complicated conditionals. Only one command is needed to solve the model over any specified interval. A comprehensive version allows the user to simultaneously estimate, solve, and compare alternate versions of a model.

Financial Modeling. EPS provides a set of built-in financial functions to calculate internal rates of return, set present values, and calculate payback periods.

Mathematical Programming. EPS allows for optimal solutions to linear and quadratic functions subject to linear constraints via built-in LP and QP functions.

Monte Carlo Simulations and Risk Analysis. A built-in RANDOM function lets users produce random samples from a wide range of underlying distributions for risk analysis. EPS also provides various probability density, cumulative probability, and inverse functions.

DRI provides large libraries of EPS routines and procedures for specialized functions. These aid in developing tailored applications and integrating externally developed packages and models into the full power of EPS. EPS routines include the following capabilities:

Modeling

EPS facilitates econometric, financial, statistical, and operations research modeling. Analysts can use built-in commands to estimate and solve simple and large-scale models, and explore alternative scenarios. They can perform goal seeking, sensitivity, and "what if" analyses. EPS can solve models with hundreds of equations, large simultaneous blocks, and multiple identities. It can also be used for operations research applications involving linear and quadratic programming, allowing the integration of these techniques with traditional econometric modeling.

Econometric modeling features include:

- Specification, estimation, and model solution in a single integrated environment;
- Alternative solution techniques including Gauss-Seidel and SOR;
- Functions for identifying, sorting, displaying, and categorizing equations and variables; and
- Routines to compare alternative models and scenarios.

Financial modeling features include:

- Probability distributions for risk analysis;
- Alternative scenario comparison;
- Various depreciation methods; and
- Built-in functions for asset, loan, and tax analysis, such as present and future value, internal rate of return, yield, and payback.

Regression Analysis

EPS offers powerful regression analysis capabilities for equation specification, estimation, diagnostics, and forecasting. Specially designed to handle large, time series databases, EPS offers built-in commands and routines for the following types of regression analysis:

- Correlation analysis;
- Ordinary least squares with first- and second-order auto correlation corrections;
- Stepwise regression;
- Two-stage least squares, with auto regressive error correction;
- Polynomial and Shiller distributed lags;
- Ridge regression;
- Nonlinear least squares; and
- State-of-the-art regression diagnostics.

EPS enhances productivity by providing a convenient environment for adding or deleting variables, leading or lagging variables, expressions, and transformations.

Statistical Analysis

Incorporated into the basic EPS software is a variety of analytic tools for summarizing data, making statistical infer-ences, and forecasting and quantifying the degree of uncertainty in decision making. The statistical techniques included are:

- Descriptive statistics, such as mean and standard deviation;
- Moving average;
- Exponential smoothing;
- Standard mathematical and trigonometric functions;
- Matrix and vector operations;
- Generation and testing of random distributions;
- Probability density, cumulative, and inverse functions;
- Cross-sectional data analysis;
- Goodness-of-fit tests;
- Nonparametric statistics;
- Interpolation and curve fitting;
- Seasonal adjustment using X-11 ARIMA; and
- ARIMA (Box-Jenkins) analysis of time series.

Data Management, Manipulation, and Transformation

EPS provides sophisticated capabilities for managing time series and multidimensional arrays and for converting from one to the other as necessary for analysis. In this way, analysts can work with data best suited to their applications. For example, economists and financial analysts can work with time series; market planners and accountants can work with cross sections, arrays, and combinations of the two. Built-in commands let analysts produce new data series and update old ones. In addition, users can develop and document their own databases so others can use them easily. All data objects can be stored in the user's workspace or in EPS banks; they can also be combined from several files into one workspace for analysis.

For manipulation of time series data, EPS is designed to handle the time dimension automatically. All standard reporting frequencies are supported, allowing users to work easily with data collected for regular periods from once an hour to once a year; users can also define their own regular or irregular reporting frequencies. In addition, the frequency of data can be changed easily, by converting to a lower frequency or distributing to a higher frequency.

For manipulation of arrays, EPS can manage up to 10 dimensions. The arrays can be manipulated as a whole or by individual elements. Array operations include matrix product, inversion, and transposition. The array mapping feature allows elements to be indexed by names and dates as well as numbers.

Programming Language Capabilities

The command structure of EPS allows it to expand from an interactive environment into a procedural programming language. EPS contains approximately 90 commands, including many of its own and some borrowed from Algol, Pascal, and APL. These commands range from logical statements and branching, through looping and begin/end blocks, to declaring arguments and local variables. All of these commands operate in a single environment. The syntax is consistent, yet flexible, across different data types. Because of these structured programming capabilities, EPS is constantly being expanded as analysts use the commands to construct and execute new procedures.

Data Display: Reports and Graphs

EPS offers analysts the option of standard reports and graphs using simple commands. For customized displays, the user can control reports on a cell-by-cell basis or build graphs from basic shapes by drawing lines and arcs. Default settings are available for most of the basic report and graph options listed below, and users can modify these settings to match their needs. All DRI forecast reports, such as the tables in the *DRI/McGraw-Hill Review of the U.S. Economy*, are generated on a production basis using EPS graphics and report writing.

Reports can be produced and manipulated as follows:

- A simple PRINT command can be used to display time series and arrays.
- The WRITE command is used to generate fairly sophisticated reports.
- More elaborate reports can be customized through separate control over individual rows and columns and the specification of individual cells in a table.
- Special features provide for control of paging, page numbering, row and column titles, subheadings, the page heading, and the page tail.

Graphics types include:

- Scatter diagrams
- Line charts
- Bar charts (horizontal, vertical, grouped)
- Pie charts
- Curve charts
- Histograms
- Bubble charts
- Icon plots
- Graphics primitives, such as arc, circle, point, and rectangle

For presentation graphics, the user can incorporate multiple plots on a page and control scaling, text fonts, and color. Graphs can be generated at terminals, printers, and plotters.

DRI feels that EPS' size and diversity of supported applications distinguish it from most other analytical languages. Workspaces of up to 12 million characters of storage are routinely handled, and this capacity is being increased. Users perform full-scale modeling on hundreds of equations, with EPS handling the innumerable accompanying details. From this same environment, users can produce sophisticated reports and graphs.

DRI/McGraw-Hill

DRI has packaged a number of powerful workspaces that provide friendly environments for certain types of analysis and data retrieval. These include:

- *Regional Information Access Workspace*—an interactive EPS workspace for retrieval of MSA data and DRI regional, state, and county data; it enables users to generate standard reports designed for cross-sectional comparisons or analyses by geographic area.
- *EstiMarket Workspace*—an interactive EPS workspace for screening, ranking, and displaying information; more than 25 report formats are available, enabling users to identify high-potential industry markets and prospects, evaluate potential sites, monitor competitor activities, target merger and acquisition candidates, and analyze the infrastructure and growth potential of individual states.
- *Examine*—tabulates most recent fundamental stock data, price, or dividend over any time period; adjusts for splits if specified by the user.
- *CUSIP*—provides on-line lookup of securities based on issuer name, ticket, or CUSIP.

User-friendly applications workspaces have been developed for almost all of DRI's databases.

RETRIEVE

RETRIEVE is an EPS-based system capable of managing large collections of cross-sectional data. The database management system provides users with standardized routines for building, updating, and accessing databases. For most applications, RETRIEVE requires little or no specialized programming skills. Using a few commands, the user can select a subset of a database and specify an aggregation scheme, a list of concepts of interest, and a frequency and interval.

RETRIEVE is currently used with several DRI product databases, including the *Construction Analysis System* for F.W. Dodge Project and Summary Data; *DRI/NPDC County Business Patterns*; *DRI/NPDC Census*; *Detailed Monthly Trade Monitor and Trade Series C International Trade Data*; and *Bureau of Economic Analysis U.S. County Data.* RETRIEVE is also used for managing DRI clients' proprietary information, such as sales and other data relating to internal operations.

DRI is developing a capability to link more than one RETRIEVE database. For example, a user might select from one database a list of mines associated with coal shipments. That list might then be used to access a separate database with information on each mine.

TEXT and ABSTRACT

TEXT and ABSTRACT are DRI's software packages for querying bibliographic databases, allowing either full- or partial-text retrieval. The searches are based on keywords specified by the user and permit the use of Boolean operators. In many cases, fields have been defined within the abstract, facilitating screening even further. Examples of databases accessible in TEXT include *McGraw-Hill News*, *CBD Plus*, *Defense-Net*, and the *DRI U.S. News Service.*

Databases released in ABSTRACT normally include smaller units of text, in which a number of files have been predefined and can be used as a search criterion. An example is the *Federal Contract Awards* database.

INDUSTRY-SPECIFIC SERVICES

DRI supports many databases and models that apply to a single industry or economic sector. DRI maintains specialized forecasts for many industrial sectors, including:

- Agriculture
- Automobile
- Chemical
- Coal
- Commercial Truck
- Construction
- Defense
- Electricity
- Energy
- Natural Gas
- Oil
- Steel
- Transportation
- Utilities

These models are supported by databases containing detailed historical information and records of key indicators for these areas of economic activity over significant periods of time. All of this data is available to users for processing and analyzing their own models and on systems incorporating their own assumptions.

MICROCOMPUTER/SOFTWARE SERVICES

DRI's comprehensive collection of information products is available for use on personal computers. PC Workspaces are microcomputer software packages designed to provide rapid solutions to specific business problems, such as cost analysis and market planning. PC Workspaces use menus and forms so that users can do their work without having to understand computer technology or programming.

PC Workstations provide comprehensive analytical capabilities, including local data storage and management, a full range of data manipulation techniques appropriate to the workstation's application—such as economic or financial analysis—and complete graphical and tabular display capabilities.

DATAPRO RESEARCH, DELRAN NJ 08075 USA

DRI/McGraw-Hill

▻ PC Workspaces

PC Workspaces are further divided into four product types, called Gateways, Monitors, Models, and Product Workspaces.

Gateways

Gateways provide links between personal computers and DRI's mainframe. Gateways contain automatic dial-up and logon facilities to connect the user's microcomputer to DRI's mainframe computer and automatic logoff procedures to disconnect from the mainframe after the information request has been processed.

On-screen forms that the user completes ensure that all required information is provided. Error-checking protocols ensure that all information sent to the PC is accurately transmitted.

Monitors

Monitors provide standardized reports, tables, commentary, and graphs from DRI's large array of services and, in effect, let users monitor the industry, economy, or business sector of special interest. Users can manipulate the way reports are displayed, for example, by producing graphs from tables or translating year-to-year price levels into percentage changes.

Models

Models enable users to perform on their desktop computers the simulations and analyses they previously did on the DRI mainframe. The advantage is cost savings realized from doing the work locally, in contrast to using a time-sharing system.

Product Workspaces

A product workspace is a set of applications software aimed at solving everyday problems encountered by specific business functions. Self-contained database management facilities eliminate the need for a mainframe link, making the user entirely independent.

PC Workstations

PC Workstations are comprehensive analytic environments, containing all the software needed to solve the full range of problems encountered in a specific discipline.

DRI's first PC Workstation, the Economist Workstation, was released in 1986. In addition to providing local storage of the normally large amounts of data needed for full economic analysis, the Economist Workstation includes software for extensive econometric analysis. It also allows a broad array of arithmetic and statistical functions, complete model building and simulation capabilities, local data management capabilities, locally generated reports and graphs, and the ability to merge DRI-provided data with the user's private data.

Like PC Workspaces, DRI's PC Workstations make extensive use of menus and forms. This user interface allows the user to focus on solving business problems, not on learning computer technology.

DRI's PC Workspaces

GATEWAYS

*PC*GATEWAY & DRI/ACCESS* provide easy access to historical and forecast data from virtually all of DRI's economic and financial databases as well as access to DRI's mainframe applications workspaces, and selected PC products.

ENERGY DATA ACCESS SYSTEM automates downloading from DRI's various energy databases to the user's PC.

INTERNATIONAL TRADE INFORMATION SYSTEM provides access to 20,000 product classifications representing commodities traded worldwide.

TRADE DATA GATEWAY provides access to product information from nine reporting countries indicating trade with all trading partners on a monthly basis.

MONITORS

U.S. ECONOMIC MONITORING SERVICE provides the most recent economic and financial news in an easy-to-access on-line newsletter.

INTERNATIONAL MONITORING SYSTEM provides textual information on economic developments for a number of advanced economies and on foreign exchange markets.

MODELS

DRI's QUARTERLY MODEL provides forecasts for 1,200 variables for a 10-to-12 quarter horizon with the basic functions of DRI's mainframe version.

DRI's ANNUAL MODEL OF THE U.S. ECONOMY provides yearly forecasts for 600 variables over a 25-year horizon with the basic functions of DRI's mainframe version.

DRI's QUARTERLY MODEL OF THE CANADIAN ECONOMY provides forecasts for corporate planners and policy analysts with the basic functions of DRI's mainframe version.

DRI/McGraw-Hill

DRI's ANNUAL MODEL OF THE CANADIAN ECONOMY provides yearly forecasts for planners and analysts by means of a 205-equation model designed for ease of use.

EUROPEAN CAR-LINE PRODUCTION MODEL is a forecasting tool on diskette that allows users to project European car production by model.

KEYRATES provides clients with DRI's monthly interest rate forecasting model on the PC.

IO/PC is DRI's industrial input-output model designed for personal computer use that enables analysts to evaluate potential economic risks and develop their own industry projections.

WORLD OIL MODEL allows users to compare alternative scenarios of the world oil picture.

PRODUCT WORKSPACES

Descriptions of representative DRI PC Workspaces follow.

MARKET SCAN is a market planning forecasting tool used by business professionals to target markets, project sales, allocate promotional resources, and deploy sales personnel. The package includes DRI industry forecasts and software to relate industry growth to user-defined markets.

GIANT is a PC-based system expressly designed for analyzing and managing geographically oriented, time-series data. Information is easily displayed in presentation-quality maps, tables, and graphs.

EPS/PC provides many of the data management, analytical, and information display features of EPS, DRI's proprietary mainframe software, including time series data management, regression analysis, seasonal adjustment, model building and simulation, report writing, and graphics.

GLOBIS is an integrated software system designed to provide a common set of analytical and database capabilities across countries available at executive briefing, detailed operating, and workstation levels.

TRADIS facilitates analysis of trade patterns across all trading partners of a country and on a detailed basis between two countries.

ECONOMIST WORKSTATION is a comprehensive analytic environment that provides the power, flexibility, and completeness of an econometric decision support system using a menu-and-form interface.

UTILITY COST ANALYZER is a PC workstation designed for constructing customized O&M composite cost escalation indexes.

U.S. COST ANALYZER provides keyword search capability, report generator, and composite cost escalation index builder.

INTERNATIONAL COST ANALYZER is a PC-based package that enables users to write reports and construct composite cost escalation indexes for their projects or products.

OEM AUTO SUPPLIER provides quarterly forecasts of production by automotive carline model, statistics on assembly plant operating conditions, and revenue estimation spreadsheets.

HEALTH CARE COST ANALYZER facilitates the use of price and wage forecasts in projecting cost escalation indexes for health care facilities.

DRI also provides a Data Delivery System (DDS), which is a mainframe-to-mainframe data transfer service.

NETWORKING SERVICES

DRI's computing and information services are accessible through either DRI's own DRINET network or the Telenet and Tymnet networks. DRINET provides dial-up local communications access to a wide variety of terminal equipment at 300 bps, 1200 bps, and other speeds in 24 U.S., Canadian, and European cities. Some users have sufficient volume to justify a direct interface to DRINET.

ON-LINE DATABASES

As illustrated in Table 2, DRI maintains an impressive array of databases and associated applications software for support of economic, financial, investment, government, and corporate planning analysts. All the information in the databases listed is accessible through DRI's proprietary software package, EPS.

The On-line Databases section (Tab OL40) of this publication features detailed information on most of these databases; summaries follow. Many of DRI's databases are available through Information Plus, allowing the user to gain access to the information without paying a subscription fee for the individual data bank. Many forecast databases are available under Forecast Plus, a similar program.

U.S. ECONOMICS

National

DRI U.S. Central contains financial, economic, and demographic indicators that provide comprehensive measures of economic activity for the United States as an aggregate. The following concepts are provided: national income and product accounts series; retail and wholesale trade; manufacturers' shipments, inventories, and orders; labor force, employment, hours, and earnings; housing starts and completions; "Quarterly Financial Report" and other industry data; and financial and consumer credit data.

DRI U.S. News Service provides the text and selected tables from a wide range of regularly scheduled and intermittent news releases on key U.S. economic indicators issued by federal agencies and private sources. The service also provides a monthly schedule of expected release dates for major federal agencies.

DRI U.S. Prices is a large collection of consumer and producer price indexes compiled by the Bureau of Labor Statistics (BLS) of the U.S. Department of Labor. Coverage includes all Urban CPIs and components; Revised Wage Earner and Clerical Worker CPIs and components; actual prices of energy components to CPI; PPIs by industry; PPIs by commodity and stage-of-processing; and PPIs for postal and telephone services.

Flow of Funds contains quarterly data describing the financial activities of major sectors of the U.S. economy and how they relate to each other. Transactions among businesses, government, households, and financial institutions are tracked. Annual balance sheet data, including household net worth, are also available.

McGraw-Hill News is a searchable database of news bulletins released by McGraw-Hill World News Service. News stories remain on-line for three months. In addition, a news "SNAPSHOT," containing five major headlines as well as the most current financial indicators, is updated hourly.

Regional

DRI/NPDC Census contains summary data from the 1980 U.S. Census. The 1980 U.S. Census Summary Tapes Files One and Three are available. Concepts include population (urban/rural, race, sex, and age); households (size, type, and number); housing units (type, occupancy, size, year built, home heating fuel, and value); employment (labor force status, industry, and occupation); and income (household, family, and sources).

DRI/NPDC County Business Patterns contains county-level data detailing employment statistics at the two- and four-digit SIC levels from the 1975, 1979, and 1981-1984 County Business Patterns. Coverage includes employment, first-quarter and annual payroll, number of firms, and distribution of firms by number of employees.

DRI U.S. County contains indicators of economic activity at the county level for the following concepts: employment by major industrial group; personal income and components; wage and salary disbursements; and population by age and sex.

DRI U.S. Regional contains indicators of economic activity in various states, regions, and metropolitan areas. Concepts include personal income and its components; labor force, employment, hours, and earnings; population and other demographics; banking and financial assets and liabilities; government receipts and expenditures; housing permits authorized and mortgage rates; manufacturing production; and retail sales.

SUPERSITE contains demographic data from CACI, Inc. from the 1970 and 1980 Censuses plus current-year updates. Five-year forecasts are also available for key concepts. Sales potential and consumer spending power are provided for 144 commercial products and services. Data are available for any market specified within the contiguous U.S., beginning with zip codes and Census tracts.

INTERNATIONAL ECONOMICS

Economies

Canadian Socioeconomic Information Management System (Cansim) Mini Base is compiled by "Statistics Canada." This database provides detailed and timely indicators of the Canadian economy for the public and private sectors.

DRI Canadian Primary Source is a collection of statistics gathered from various economic and financial publications issued by industry, trade, and government sources. Presents industrial sector detail and regional and provincial aggregates for capital expenditures, housing, immigration, financial activity, and exchange rates.

DRI Current Economic Indicators provides timely coverage of major financial and economic indicators for Australia, Canada, Europe, Japan, the United States, and selected developing countries. The economic indicators provided include balance of payments and merchandise trade; consumer and wholesale price indexes; foreign exchange rates, including trade-weighted and reserves; industrial production indexes (total, manufacturing); money supply and interest rates; national income accounts (nominal and real); retail sales; and unemployment and wages.

DRI Developing Countries provides economic profiles for the major Asian, Latin American, African, and Middle Eastern developing countries. Concepts include balance of payments, employment and labor force, foreign exchange, international trade, money supply, national income accounts, prices, production, and population.

DRI Europe contains macroeconomic, microeconomic, and financial indicators for Australia, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, and Yugoslavia. Available data, which is gathered from national sources, includes balance of payments and trade; construction; consumer and retail trade; industrial production by activity; interest and exchange rates; labor force and employment by sector;

money supply and components; national income and product accounts; and wages and prices by sector.

Europe Satellites is a collection of data sets transmitted monthly to DRI in machine-readable form by major statistical agencies and financial institutions in Germany, Italy, and the United Kingdom. This data includes detailed economic, financial, and demographic information reflecting industrial activity, national accounts, trade, prices, and employment conditions.

NIKKEI Macro Economic Statistics contains economic, demographic, and financial indicators to depict a comprehensive profile of the Japanese economy including national income accounts, balance of payments, manufacturing and industrial production, employment and labor force, prices, banking and finance, trade, and household income and expenditures. Data are provided by special arrangement with Nihon Keizai Shimbunsha.

OECD Main Economic Indicators is a compilation of economic, demographic, and financial indicators for the Organization for Economic Cooperation and Development (OECD) member nations. Coverage for each country encompasses the following concepts: national product; production, deliveries, stocks, and orders; construction; domestic and foreign trade; labor force and employment; prices and wages; domestic and foreign finance; and balance of payments and international liquidity.

OECD National Accounts provides annual data for OECD member nations, standardized to provide comparability across countries. Concepts include distribution of national income; gross capital formation, financing, and composition; household income, outlays, and consumption; and volume indexes and price deflators.

Trade and Finance

DRI ITIS Detailed Monthly Trade Monitor contains timely primary source data recording exports and imports for up to 20,000 specific commodities for nine major industrialized countries with each of their 205 trading partners. Areas covered include value of trade in national currency; quantity or volume of trade; detailed national product classification schemes cross-referenced with the Standard International Trade Classification (SITC) system; and U.S. trade by Customs District.

DRI ITIS Trade Series C provides statistics from the Organization for Economic Cooperation and Development's Trade Series C, detailing bilateral trade flows for 24 nations with over 190 trading partners. Commodity detail is at the one-, two-, three-, and five-digit Standard International Trade Classification levels, totaling more than 2,100 items at the five-digit level for imports and exports. Statistical coverage includes both the volume and value of imports and exports.

IMF Direction of Trade contains total import and export statistics by country of origin and destination. The country/partner data is supplemented by world and area aggregates. All data are expressed in U.S. dollars for comparison.

IMF International Financial Statistics is a collection of economic and financial statistics for the 176 member nations of the International Monetary Fund (IMF). Major areas of coverage include exchange rates; international reserves and components; money and banking statistics; interest rates, prices, and production; international trade; government finance; national income accounts; population; and commodity prices.

ENERGY

Industry

DRI Energy provides state and national data that describe the U.S. energy sector from resources and primary production, through transformation into energy products, to final consumption by energy consuming sectors. Major concepts include statistics on crude oil, coal, motor gasoline, naphtha, nuclear power, and electricity sectors for the following concepts: exploration and production; consumption, demand, and deliveries; imports and exports; reserves, stocks, and inventories; refinery, gas plant, and utility operations; and retail and wholesale prices and sales. Key international data complements U.S. coverage.

Natural Gas

DRI Natural Gas Spot Prices details the entire gas spot market. Where available, spot prices are quoted at each major transaction point: at the well-head, as delivered to the pipelines, at the citygate for local distribution, and at the burner-tip for electric utilities for large industrial users.

Oil

DRI International Oil provides country-specific information on oil and natural gas production, consumption, stocks, imports, and exports for members of the International Energy Agency and the Organization for Economic Cooperation and Development. Similar country-level data are available for the U.S. as reported by the U.S. Department of Energy. DRI estimates of OPEC and non-OPEC crude oil production are also provided.

Platt's Oil Prices details domestic and international crude oil and petroleum product spot prices. Official and spot prices are available by foreign crude type; product prices are available generally by market locations and subdivided by sulfur content. International prices include European bulk cargo rates and tanker and barge quotations. Domestic and European chemical prices for the U.S. Gulf Coast mar-

▷ kets are offered. Major fuel coverage includes crude oil, motor gasoline, heating oil (gasoil), distillate fuels, and residual fuels.

FINANCIAL

Capital Markets

AIBD Eurobonds provides yields and prices for all traded Eurobonds. Data are provided daily from the Association of International Bond Dealers and are checked and monitored by DRI. Descriptive characteristics such as type of security, coupon rate, maturity date, and currency coding accompany each series.

DRI Commodities contains price and trading activity information for all major commodities traded in the United States, Canadian, London, and Singapore markets, including financials, food and feed grains, livestock and meat products, fibers and wood, metals, and energy futures.

DRI Financial and Credit Statistics provides extensive coverage of interest rates, commercial bank assets and liabilities, and foreign exchange and thrift institution activity. Data cover U.S. interest rates, international rates, financial operating statistics of banks, and major stock market indexes and options.

DRI U.S. and Canadian Equities contains daily pricing, dividend, and current fundamental information for more than 45,000 U.S. and Canadian equity issues. All issues on the NYSE, AMEX, OTC, and regional exchanges are covered, as well as those from the Toronto and Montreal exchanges.

DRI U.S. Bonds provides daily pricing, interest, and fundamental information for over 60,000 dealer-priced debt issues, including corporates, private placements, convertibles, mortgage-backed, and U.S. government securities.

ScotiaMcLeod Canadian Fixed Income presents extensive Canadian fixed income and money market information from ScotiaMcLeod. Historical pricing and descriptive data dates back to 1973 for money market data and to 1982 for Canadian bonds. Debt market indexes are available from 1947.

Performance

DRI Financial Market Indexes provides a comprehensive and expanding collection of daily and weekly financial indexes with which to monitor market performance and trends. Five hundred daily and weekly indexes cover the U.S. and international markets for equities, fixed income, futures, options on futures, and other instruments.

Morgan Stanley Capital International Indexes provides almost 700 indexes that reflect equity markets by country, region, and industry. Price indexes are updated daily; other series, monthly. Adjustments have been made to ensure comparability, providing a benchmark for measuring performance across 19 countries, 12 international regions, and 38 industry sectors.

Russell Equity Indexes provide statistical information on the structure and performance of the Russell Equity Indexes, a diverse set of indicators geared to match a wide range of investment approaches. Provided by the Frank Russell Company, the database represents a significant reference tool for portfolio managers, investment analysts, plan sponsors, and strategic planners.

Securities Industry Aviation provides balance sheet and income statement data for 19 sectors of the securities industry. Market indicators review outlook and planning decisions of security firms. Also available are market value and volume of stocks traded on the exchanges, issues of convertible and nonconvertible bonds and preferred and common stock, credit market debts outstanding, and mergers and acquisitions.

Standard and Poor's Industry Financial presents selected income account and balance sheet items, as well as the well-known stock price indexes for over 100 industries, including disaggregations of the industrial, transportation, financial, and public utilities sectors of the economy.

Firms and Accounts

COMPUSTAT provides detailed balance sheet and income statement items for more than 6,000 industrial companies, 250 utilities, 145 banking institutions, and 200 telecommunications firms, as well as financial information on individual business divisions of over 3,000 companies. In addition, data for 300 Canadian companies are included.

Financial Post Investment contains business data on major Canadian corporations compiled by the staff of *The Financial Post* from the balance sheets, income statements, and annual reports provided by each company. Information featured includes stock price indexes, earnings per share, and shares outstanding; capital expenditures; cash flow and inventories; and income tax items.

NIKKEI Corporate Financials presents the financial position of approximately 1,700 Japanese companies, both publicly traded and other corporations that must issue annual reports. Concepts include balance sheets, income statements, number of stockholders and shares outstanding, corporate land holdings, production costs, and financial relationships with affiliates and subsidiaries. ▷

DRI/McGraw-Hill

INDUSTRIAL

All Industries

DRI CIS Cost and Industry provides indicators for prices, wages, and their determinants. Concepts include production, consumption, inventories, imports, and exports of nonferrous metals; wage rates, labor shortages, and construction indexes for construction and building trades by metropolitan areas; leadtime data by commodity and city; salaries for professional, technical, administrative, and clerical occupations; and export and import price indexes by commodity.

Trinet Company contains descriptive and statistical information on U.S. businesses with more than 20 employees. Provided by Trinet, Inc., annual data for more than 200,000 public and private companies are available, including number of employees and establishments, lines of business, sales, and level of diversification. The database is updated quarterly.

Trinet Location contains information on nearly 500,000 business establishments encompassing every site with 20 or more employees. Data items include name and address of establishment; telephone number; county and metropolitan statistical area designations; industry code (Standard Industrial Classification); size factors (number of employees and sales); and corporate family data (parent company and cross-reference to other divisions).

DRI European Sectoral offers what DRI claims is a unique collection of data on developments within the industrial and service sections of France, Germany, Italy, and the United Kingdom. The 3,000 series cover such concepts as production, value added, employment and earnings, capital formation, and consumer expenditures.

Agriculture and Chemicals

DRI Agriculture provides domestic and international commodity supply, demand, distribution, and price information. Government policy variables and trade information complement the system. Information available includes crop production; acreage planted and harvested; livestock production and slaughter; commodity supply and use; farm prices, cash receipts, and farm income; and exports and imports.

DRI Chemical contains extensive coverage of economic, market, and financial conditions in the chemical industry. The information available includes general indicators by type of chemical (production, sales, prices, financial data for chemical companies) and plant capacities (product, process, company, location).

Platt's Chemical Prices contains weekly data detailing domestic and worldwide petrochemical prices compiled by the McGraw-Hill Publications Company. Three hundred spot and contract prices are available for markets in the U.S., Japan, and northwest Europe.

Construction

Dodge Building Stock offers a unique collection of historical and forecast data on square footage of floor space for 15 structure types within the commercial, institutional, residential, and manufacturing construction categories. Data are available at national, state, metropolitan area, and county levels.

Dodge Construction Analysis System provides construction statistics at the individual project level and selected regional and conceptual aggregations of contracts. Aggregated data is available for more than 3,000 counties; more than 200 structure types; two ownership categories (public and private); value; square footage; and number of projects and dwelling units. Project-level data can be screened by county, structure type, ownership, type of construction (new, addition, alteration), story height, framing material cost, and builder type.

Handy-Whitman Index is a collection of plant construction cost indexes for electric, gas, water, and telephone utilities, reflecting the level of building costs for major types of utility construction. Data are disaggregated into six geographic regions of similar characteristics.

Dodge/LSI provides usage trends for construction materials and supplies in the residential building market. Annual data are available for detailed categories of materials and equipment, reflecting activity at the national, state, and county levels.

Defense

Budgetrack/Congressional Status provides timely historical data and forecasts of the U.S. federal budget, focusing on the Department of Defense and NASA. Each major decision is recorded during the budget process, from presidential submission to final congressional action, including such items as procurement and R&D budgets, mission assignments, and project-level detail.

CBD Plus contains current information on U.S. government contracting activity. Two primary sources of data—*Commerce Business Daily*, from the Department of Commerce, and the Blue Tops press releases, from the Office of the Assistant Secretary of Defense (Public Affairs)—are merged daily, creating one complete source of contract award and procurement information. Included are Requests for Proposals, Invitations for Bids, and Requests for Quotations. The database contains several different classifications of information on procurements; research and development sources sought; contract awards; defense department releases; surplus property sales; foreign government standards; and special notices and business news.

Congressional Testimony provides complete text of unclassified testimony made by Department of Defense spokespeople, other government officials, and industry experts before the Congress regarding defense programs and other subjects of interest, including military strategy, procurement, R&D, and defense contractor relationships.

Defense-Net summarizes defense-related articles, news items, and interviews from around the world. Compiled by Teldan, an Israeli information company, the abstracts detail new products and weapons, military industries, economic and military procurement policies, and technical documents.

DRI Federal Contract Announcements contains the actual text of federal government contract awards, taken from the *Commerce Business Daily* and the Defense Department's "Blue Tops."

DRI Federal Contract Awards provides in-depth statistical and textual information on unclassified prime contract awards for R&D services or actual production. Contractor and agency information and contract detail are available from fiscal year 1981 forward from DOD, DOE, DOT, and NASA.

Forecast International Online offers detailed analyses of the underlying factors and competitive forces that drive the international defense market. Eight market service reports and four newsletters, published by Forecast International, Inc., also provide projections for all programs based on procurement cycles, funding estimates, planning requirements, and market trends.

Program Element/Contract Number Translations contains explicit linkages relating selected RDT&E program elements and contract awards.

Program Element Descriptive Summaries contains all unclassified Department of Defense Program Element Descriptive Summaries (PEDS) from the Army, Navy, Air Force, and Defense Agencies in an unabridged, full-text form.

Forestry, Wood, and Wood Products

Random Lengths provides prices for a variety of lumber and panel products as presented in the Lumber and Plywood Market Reporting Service publications. Covers lumber, shingles and shakes, veneer, particleboard, and waferboard by dimension and grade.

RISI Forest Products contains series on the U.S. and Canadian lumber plywood industries; the U.S. particleboard, waferboard, oriented strand board, and hardboard industries; and U.S. timber resources. Information featured includes production variable costs; stumpage growth and prices; production, shipments, inventories, and orders; demand and capacity; lumber, plywood, and particleboard prices; imports, exports, and transportation rates; end-use consumption and use factors; and housing starts and mobile home production.

RISI Pulp and Paper contains indicators directly related to the U.S. and international pulp and paper industry and its end markets. Major concepts include production, shipments, and capacity; prices, imports, and exports; costs; and inventories, demand, and end-use market indicators.

Metals

DRI Steel contains time series on iron and steel production and shipments and component raw materials. Major concepts include raw steel production with process detail; steel mill shipments with product and market detail; steel product prices and price indexes; raw materials quantities and prices; steel imports and exports by product and by country of origin and port of entry; and steelworker compensation and productivity.

Metals Week provides detailed price information for the international nonferrous metals industry. Coverage includes major metals (aluminum, copper, lead, tin, and zinc), precious metals (silver, gold, and platinum), ferroalloys, light and other metals, and currency exchange rates.

Transportation

Automotive News details the status of the U.S. automobile market at a nameplate level. Detailed statistics on Canadian car and truck production, U.S. light-truck sales, and imported car sales are available. Other concepts include production, days' supply, sales, option installations, prices, physical specifications, and general market indicators.

DRI International Auto is a collection of key indicators on the international automobile industry. Annual and monthly data cover new registrations by make and model; vehicles in operation by make; production by make, model, and cylinder size; exports by country of destination, by make and model; imports by country of origin and by make; and sales by make.

DRI International Truck provides key indicators of the international truck industry, including imports by country of origin; new registrations by make and weight class; production by make, weight class, and type of fuel used; scrappage; and vehicles in operation by make and weight class.

DRI Transportation contains information on the following modes: Class I and Class II rail and motor carrier, air- and water-borne (inland, coastwise, local, lakewise), and air traffic. Coverage includes commodity traffic by make, region, and carrier; carrier operations and financial data; transportation equipment stocks and sales by make; industry shipments by commodity and region; and exports and imports of commodities.

▷ *DRI Transportation Detail* is a collection of specialized statistics describing particular facets of the transportation industry.

OTHER SERVICES

DRI provides consulting services to clients worldwide who need to solve business and policy planning problems. A professional consulting staff draws on DRI's analytic and forecasting capabilities, data, and software technology to provide custom-designed analysis systems for individual clients. A field consulting organization further assists clients in their day-to-day use of DRI data, models, software, and computer resources. ☐

Data-Star

Data-Star, an on-line service of the Information Products Division of Radio Suisse SA, Berne, Switzerland, offers more than 150 databases in the areas of business, science, medicine, engineering, and technology. These databases include more than 25 files that are unique to the company, including several in the pharmaceutical and business fields.

One of Data-Star's objectives is to make European information available worldwide. It markets its services through offices in Switzerland, the U.K., West Germany, and France. The company opened its first North American office (based in Wayne, Pennsylvania) in 1987.

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Pricing 109

COMPANY INFORMATION

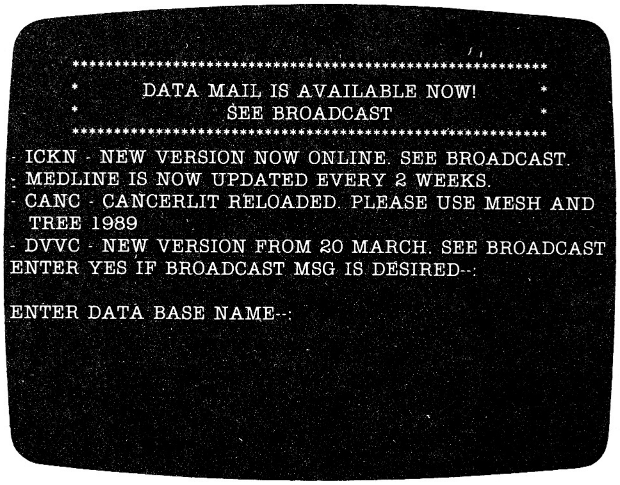
Data-Star
℅ D-S Marketing Ltd.
Suite 110, 485 Devon Park Drive
Wayne, Pennsylvania 19087 (215) 687-6777,
(800) 221-7754

UPDATE: *Data-Star now offers more than 150 databases, up from the 120 databases reported in our previous version of this report. The company also introduced computer-based training products for simulating on-line searching and illustrating Data-Star system commands. In addition, Data-Star instituted a 12-hour discount policy that gives users a substantial discount when searching databases between 1 p.m. and 1 a.m., EST.*

Company Background

Data-Star is a service of Radio Suisse SA, Berne, Switzerland, a leading supplier of advanced telecommunications and information services. Founded in 1981, Data-Star offers more than 150 databases in the areas of business, biomedicine, chemistry, engineering, and biotechnology. Data-Star is marketed worldwide by D-S Marketing Limited, based at 114 Jermyn Street, London SW1Y 6HJ, England, Telephone (01)-930 5503. In April 1987, Data-Star opened its first U.S. office to promote and market its on-line service in North America.

In 1986, Data-Star divided its databases into several subject-specific services, focusing on business (which encompasses four distinct services), biomedicine, chemistry, biotechnology, and technology. By marketing its databases in this way, the company hopes to make it easy for users to select the most appropriate database for their needs. Another goal is to make it easier for search intermediaries (e.g., information professionals) to promote the concept of on-line searching to end users.



```
      **********************************************************
      *         DATA MAIL IS AVAILABLE NOW!                    *
      *              SEE BROADCAST                             *
      **********************************************************
- ICKN - NEW VERSION NOW ONLINE. SEE BROADCAST.
- MEDLINE IS NOW UPDATED EVERY 2 WEEKS.
- CANC - CANCERLIT RELOADED. PLEASE USE MESH AND
  TREE 1989
- DVVC - NEW VERSION FROM 20 MARCH. SEE BROADCAST
ENTER YES IF BROADCAST MSG IS DESIRED--:

ENTER DATA BASE NAME--:
```

Figure 1. Data-Star's top menu.

Since the company entered the U.S. on-line market, it has aggressively promoted the availability of its service. Press releases and space advertisements launched the effort, followed by appearances at major trade shows, including the annual National Online Meeting, held in New York City.

Competitive Position

In Europe, Data-Star competes with Questel, European Space Agency/Information Retrieval Service (ESA/IRS), and Pergamon InfoLine. In the U.S., a market that Data-Star entered as recently as 1987, it views DIALOG as its main competitor.

Data-Star reports that use of its services was greater than anticipated during the past couple of years. Growth was particularly high in the U.S., where Data Star reports the number of users grew by 400 percent in one year. In fact, in spring 1988, Data-Star doubled its computing capacity to handle the increased demand for its services. This also permitted major software enhancements to be made, which, according to Data-Star, will result in many system improvements over the years. Some of these, including a new electronic mail system and the ability to gateway to other services, are already in place. Other services are scheduled to be available shortly.

▷

RESOURCES AND FACILITIES

Systems Software

OPERATING SYSTEM: Data-Star's search language is based on a customized version of BRS Information Technologies software. On-line help is available through simple commands.

Customer Support/Sales and Marketing Services

Data-Star offers business, biomedical, and chemical manuals, which describe the Data-Star databases available for each of those categories. The manuals also give detailed instructions on how to search the databases covered and include a list of search aids provided by the database producer.

In addition, Data-Star has produced two "Teach-Yourself" diskettes: one for business and the other for science. Data-Star designed these diskettes to stimulate on-line searching and illustrate Data-Star system commands. A third diskette for TRADSTAT was designed to demonstrate that database's menu-driven interface.

Data-Star also offers a *System Reference Manual*, which describes the Data-Star retrieval language and its user databases: *Cros*, *News*, and *Account*. Assistance through a toll-free Help Desk is available as well. In addition to on-line help and help-desk assistance, Data-Star offers 2½ hours of free search time to all new customers on any of its databases, including all on-line printing. One half hour of free search time is regularly given to all its customers on newly launched databases. Data-Star launches new databases at the rate of two per month.

The company offers four types of training seminars in the U.S. (Currently, all training seminars in the U.S. are provided free of charge.)

- *Data-Star Overview*—describes the company's major databases and unique files. The session also covers costs and access and searching capabilities.
- *Data-Star for Online Users*—reviews Data-Star's command language. It is designed for those with experience in on-line searching.
- *Business Information Seminar*—reviews the Data-Star command language with special emphasis on the major business files available through the Data-Star on-line service.
- *Pharmaceutical Information Seminar*—reviews the Data-Star command language with special emphasis on obtaining pharmaceutical information from its medical and business databases.

Data-Star users also receive the company's monthly newsletter, *Data-Star News*.

NETWORKING SERVICES

U.S. users can access Data-Star through the Telenet data communications network. The Data-Star system is normally available 22 hours daily. It is not available Monday to Friday, 10 p.m. to 12 a.m. EST or on Saturday from 12 a.m. to 3 a.m. EST. Telecommunications charges are $11 per hour.

ON-LINE DATABASES

Data-Star offers access to more than 150 databases. These databases are marketed individually and through one of nine subject-oriented services that bring together related databases.

Brief descriptions of Data-Star's databases follow. Many of these databases are profiled in depth in the On-line Databases section of this publication (Tab OL40).

Biology/Medicine

AIDS Database (AIDS)—critically evaluated records of important work on AIDS and the human retroviruses. The references contain full bibliographical details including authors' affiliations; approximately 50 percent of the citations include abstracts.

Biosis Previews (BIOL)—information from both *Biological Abstracts* and *Biological Abstracts/Reports, Reviews, Meetings (BA/RRM)*, formerly titled *BioResearch Index*. The database is concerned with all living things and emphasizes their identification (taxonomy), life processes, environment, and applications.

BMA Press Cuttings (BMAP)—the British Medical Association's Press Cuttings file, covering information on current medical affairs as reported in the media.

Cancerlit (CANC)—citations and abstracts of articles dealing with the treatment, epidemiology, and immunology of cancer and all aspects of chemical, physical, and viral carcinogenesis.

Catalogue of Biomedical Serials (RPMS)—the on-line version of the *Union Catalogue* of biomedical serials in Swiss Libraries, which identifies and catalogs titles of biomedical journals and supplies names and addresses of the Swiss libraries where the literature is available.

Current Biotechnology Abstracts (CUBI)—extensive coverage of the scientific, technical, and technocommercial literature pertaining to biotechnology. Approximately 170 of the world's primary technical journals are scanned for the database. Some of the items included are full articles, reviews, patents, technical news items, press releases, and book announcements.

Data-Star

DHSS-Data (DHSS)—the database of London's Department of Health and Social Security Library, based on the library's abstracting and current awareness bulletins. The file covers health service and hospital administration, medical equipment and supplies, public health, nursing and primary health care, occupational disease, social services and social policy, social security, and occupational pensions.

Diogenes (DIOG)—contains documents and news stories relating to the regulation of drugs and medical devices. The database includes unpublished FDA documents acquired under the Freedom of Information Act and newsletters published by Washington Business Information and the FDA.

Excerpta Medica (EMED)—a major information source on significant basic research and clinical findings in human medicine and related disciplines, including biological sciences relevant to human medicine. The database includes material drawn from some 3,500 journals and proceedings, books, handbooks, monographs, and dissertations.

FDC Reports (FDRC)—the full text of three weekly specialized publications—*The Pink Sheet, The Gray Sheet*, and *The Rose Sheet*. These publications contain business, legal, and scientific news of the pharmaceutical, medical device, and cosmetic industries.

Forensic Science (FORS)—a multidisciplinary database covering drugs and toxicology, forensic biology, forensic toxicology, forensic chemistry, documents and forearms examination, forensic pathology, case law, and information and computing as well as safety and management aspects of running a Forensic Science Service.

General Practitioner (GPGP)—contains the full text of three publications aimed at the medical practitioner: *General Practitioner, Mims Magazine*, and *Medeconomics*.

HSEline (HSLI)—covers all aspects of health and safety at work. These include the areas of science, technology, manufacturing industries, agriculture, production, occupational hygiene, safety, explosives, engineering, mining, and nuclear technology.

IDIS Drug File (IOWA)—presents an on-line index to the *IDIS Drug Literature Microfilm* file, which contains some 240,000 articles on drugs and drug therapy in humans.

International Pharmaceutical Abstracts (IPAB)—comprehensive coverage of worldwide pharmaceutical literature. The database includes topics ranging from drug use and adverse reactions and interactions to pharmacy practice and drug research and technology.

IRCS Medical Science Database (IRCS)—the full text of all articles published in the journal series *IRCS Medical Science* since 1981. The series consists of current medical and biomedical papers of clinical significance.

Kosmet (KOSM)—covers articles from periodicals, congresses, and seminars on all matters related to cosmetics and perfumes, in particular the scientific and technical areas.

Laboratory Hazards Bulletin (LHBU)—information on hazards likely to be encountered by the chemical and biochemical laboratory and research worker, which might adversely affect the health and safety of personnel.

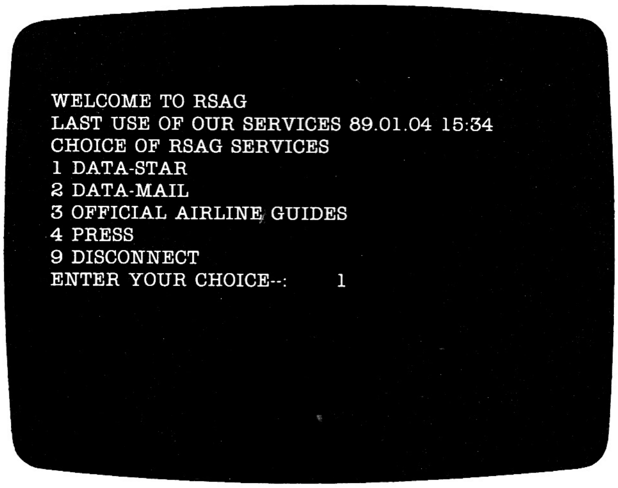
Martindale Online (MART)—evaluated information on most drugs and medicines used in therapeutics worldwide. The database includes information on more than 5,000 compounds used in thousands of preparations.

Medline (MEDL)—a major biomedical database produced by the U.S. National Library of Medicine (NLM), covering medicine (including dentistry and veterinary medicine), toxicology, biochemistry, medical psychology, pharmacology, and microbiology.

Nursing and Allied Health (NAHL)—literature references aimed at nurses and allied health professionals. The database covers nursing as well as allied health disciplines, including cardiopulmonary technology, health education, medical and laboratory technology, and occupational therapy.

Pharmline (LINE)—covers a wide range of drug-related literature including pharmacy practice, with emphasis on adverse drug effects.

Psychological Abstracts (PSYC)—coverage of the clinical and behavioral sciences literature, including material derived from more than 900 journals and monographs. The database spans original research, reviews, discussions, theory, conference reports, panel discussions, and case studies.



```
WELCOME TO RSAG
LAST USE OF OUR SERVICES 89.01.04 15:34
CHOICE OF RSAG SERVICES
1 DATA-STAR
2 DATA-MAIL
3 OFFICIAL AIRLINE GUIDES
4 PRESS
9 DISCONNECT
ENTER YOUR CHOICE--:      1
```

Figure 2. Data-Star is available as a menu item through Radio-Suisse's on-line system. Eventually, other services will be added to the Radio-Suisse system.

Data-Star

▻ *Sciscan (SCCC)*—a current awareness service for the international journal literature of science and technology. Sciscan covers five Current Contents editions: Life Sciences; Clinical Practice; Physical, Chemical, and Earth Sciences; Agriculture, Biology, and Environmental Sciences; and Engineering, Technology, and Applied Sciences.

SciSearch (SCIN)—a multidisciplinary index to the international journal literature of science and technology. The database corresponds to the printed *Science Citation Index.*

SEDBASE (SEDB)—contains close to 20,000 synopses of clinically relevant drug reactions and interactions reported in the international literature.

Sociological Abstracts (SOCA)—abstracts from the world's literature in sociology and related disciplines. The database is geared to sociologists and professionals in business, the media, advertising, academia, and service organizations. Among the subjects covered are theoretical and applied sociology and related disciplines, including political science, gerontology, feminist studies, and policy and forecasting sciences.

Toxline (TOXL)—contains references to published material and research in progress in such areas as adverse drug reactions, carcinogenesis, mutagenesis, teratogenesis, environmental pollution, and food contamination.

Business

ABC Europe (EURE)—provides detailed information on 149,000 companies in 32 European countries. Company details cover address, ABC industry code, management and ownership, number of employees, telephone/telex/fax numbers, representation, year of establishment, and capital.

ABC West Germany: German Buyers' and Sellers' Guide (ABCE)—provides detailed information on 76,000 German companies and their products.

ABI/Inform (INFO)—summaries of articles from over 650 U.S. and other English-language business, management, and administration journals. The database also includes some European non-English-language journals dated after August 1981. ABI/Inform is designed for managers and administrators as a source of ideas, concepts, tested methods, tactics, and strategies.

Abstracts in BioCommerce (CELL)—short, up-to-date abstracts of commercial biotechnology news from trade journals, scientific periodicals, newsletters, and U.K. newspapers. The database is intended for business planning, science policy review, and investment analysis.

American Banker (ICBR)—news of importance to banks and the financial community at large.

BDI: The German Industry (BDIE)—provides detailed information on 18,000 major export-oriented German companies and their products.

BioBusiness (BBUS)—encompasses scientific and business publications that contain information pertinent to the scientific business community. The fields covered include agriculture, including crop and animal production; pharmaceuticals; foods and beverages; and biotechnology, including genetic engineering.

BIS-Infomat (EBUS)—a source of timely business information. The database monitors 1,000 issues of business newspapers, trade journals, broadcasts, and reports each month.

Business (BUSI)—a European database on worldwide trade opportunities, business contacts for manufacturing, marketing, sales, services, representations, cooperations, research, and development. Coverage is worldwide for all industries.

Business/Professional Software (SOFT)—information on a wide range of software packages. The database includes the following details: description, name and address of manufacturer, price and number of installations, operating system, and programming language.

Chemical Business NewsBase (CBNB)—a major source of business information for the chemical industry. The database contains summaries from core European journals, major U.S. and Japanese sources, company literature, annual reports, press releases, government and EEC literature, market research reports, and stockbroker reports. It collects published facts, figures, reports, and comments on chemicals or factors affecting chemical production.

Chemical Industry Notes (CIND)—covers recent events in the chemical industry. Aspects the database covers include production pricing information, sales, facilities, products and processes, and corporate and government activities.

Chemical Plants Worldwide (PLAN)—contains 17,000 records of chemical plants worldwide, giving details of company name, location, present capacity, future/extra capacity, start-up date, process, feedstock, and licensor.

Computer Database (CMPT)—designed to provide answers to questions on hardware, software, peripherals, and services. The database includes product evaluations, comparisons and best buys, details of hardware/software compatibility, and pricing information. The information is taken from more than 700 computer-related journals and other sources.

Creditreform (DVVC)—contains about 350,000 profiles of companies in West Germany and West Berlin. Information is provided on registered companies with the following legal forms: OHG, KG, GMBH, and AG.

Data-Star

Development Business Scan-A-Bid (SCAN)—contains information on international procurement notices for Third World development projects funded by the World Bank, InterAmerican Development Bank, Asian Development Bank, and the Commission of European Communities/European Development Fund.

Disclosure (DISC)—contains financial and management information on over 12,000 public companies that trade their stock on the New York Stock Exchange (NYSE), American Stock Exchange (AMSE), National Association of Securities Dealers Automated Quotation (NASSDAQ) service, and other over-the-counter markets.

Dow Jones News Service (DJNS)—news and financial and business information from *The Wall Street Journal*, *Barron's*, and the *Dow Jones News Wire Service.*

East European Chemical Monitor (EECM)—East European business information covering the chemical industry sector. The database includes company information, marketing information, new capacity details on new products, etc. It includes a general section plus coverage of six product groupings: basic and general, agrochemicals, petrochemicals, plastics, chemical fibers, and pharmaceuticals.

Electro/Electronic Buyers' Guide (ZVEE)—contains references to electrical and electronic products manufactured or offered for sale by about 1,950 companies in Germany.

Electronic Selective Archives (SDAA/ATSA)—the full-text wire service of the Schweizerische Depeschenagentur, which makes its information available to the Swiss press, radio and television, and other public and private organizations.

European Chemical News (CNEW)—provides the full-text version of European Chemical News, available on-line before the printed copy.

Fairbase (FAIR)—reports on important trade fairs, exhibitions, and conferences worldwide. The database covers forthcoming events as well as events that occurred over the course of the past year. It includes information on when and where an event will take place and what is available for a particular industry sector.

Financial Times Business Reports (FTBR)—a current awareness service for the electronics and media markets. It includes news, comment, and market analysis of new technologies, telecommunications, electronic and office automation equipment, radio and television broadcasting, cable and satellite transmission, videotex, and electronic publishing.

Financial Times Company Information (FNTL)—a leading source of European company information. The database covers all articles from the London and Frankfurt editions of the *Financial Times* newspaper that refer to a company.

FINF-Numeric, COIN-Numeric (FINN/COIN)—contains balance sheets, profit/loss accounts, and ratios of Germany's biggest industrial, trading, and service companies.

FINF-Text (FITT)—abstracts of business news articles taken from the major German business newspapers.

Foreign Trade and Econ Abstracts (IEAB)—information on market trends, foreign markets, economic developments, trade, science and climates, import regulations, managerial problems, export business, and investment climates.

Frost and Sullivan Market Research Reports (FSFS)—details of market research reports currently available from Frost and Sullivan. Summaries are provided for each report. The reports cover a broad range of areas including data processing, energy and power systems, chemicals and plastics, communications, electronics, defense, and aerospace.

German Buyers Guide (E1x1)—provides information on 57,000 German companies and their products. Company details cover address, telephone number, and the 1x1 industry code.

Harvard Business Review/Online (HBRO)—full-text coverage of the *Harvard Business Review*. Included are articles on the full range of strategic management subjects of interest to managers including accounting, international trade, organizational behavior, business ethics, industrial analysis, strategic planning, automation, and marketing.

Hoppenstedt (HOPE)—the on-line version of the directory *Handbuch der Grossunternehmen*. It provides detailed company descriptions of all subsidiaries and business enterprises of 35,000 major companies in the Federal Republic of Germany and West Berlin.

Hoppenstedt Austria (HOAU)—the on-line version of the directory *Oesterreich 2000*. The database provides detailed descriptions of all subsidiaries and all business enterprises of more than 3,000 major companies in Austria.

Hoppenstedt Netherlands (HONL)—the on-line version of the directory *NEDERLANDS ABC VOOR HANDEL EN INDUSTRIE*. The database includes profiles of 20,000 Netherlands-based companies.

ICC Key Notes (ICKN)—detailed market information on approximately 175 U.K. industry sectors; it contains the full text of the *Key Note* reports published by the ICC.

ICC Research (ICBR)—company and industry research reports from 15 major British and international stockbrokering houses.

ICC UK Companies Database (ICUK)—a directory of all limited liability companies in the United Kingdom; features extensive financial data on more than 60,000 organizations.

ICIS-LORS Oil and Chemical Reports (LORS/LORD)—comprehensive market reports and assessments for more than 100 commodities from crude oil to fertilizers.

ICC Full-Text Company Reports and Accounts (ICAC)—contains the full text of the Annual Reports and Accounts published by the British quoted companies. The database includes information on how the company views its prospects as well as its performance, detailed data on the composition of the accounts, figures for the divisional and regional activities, and product details.

ICC Canadian Companies (ICCA)—detailed profile, financial, and performance data for roughly 5,000 top Canadian companies. The number includes over 1,400 public companies trading on five Canadian stock exchanges.

Industry Data Sources (HARF)—identifies and describes sources of financial and marketing data on 65 key industries. The database emphasizes market research reports; also included are investment brokerage research reports, special issues of trade journals, directories, and yearbooks.

Investext (INVE)—the full text of company and industry reports, which can be used for a wide range of business intelligence activities, including competitive analysis; market research; and evaluation of companies for acquisition, corporate planning, and sales planning. Coverage includes 2,500 U.S. companies, 1,500 public non-U.S. companies, and more than 50 industry groups.

Management Contents (MGMT)—broad coverage of a variety of business and management-related topics including accounting, decision science, economics, finance, government and public administration, industrial relations, management, managerial economics, marketing, operations research, personnel, and production.

Materials Business File (MBUS)—technocommercial developments in metals and engineered products including ceramics, polymers, composites, and plastics.

Measurement and Controls Buyer's Guide (MRAE)—contains references to measurement and controls products manufactured and offered for sale by approximately 2,900 companies in Germany, Switzerland, and Austria.

Petroleum Abstracts (PEAB)—articles relating to the petroleum and energy business. It covers company and government news and plans, economic factors, and environmental issues.

Pharmaprojects (PHAR)—product information from the publication *Pharmaprojects.* The database covers pharmaceutical products, including biotechnological products, new formulations, and combinations under development worldwide.

Pharmline (LINE)—covers a wide range of drug-related literature including pharmacy practice, with emphasis on adverse drug effects.

Pharmacontacts (PHCO)—directory of names and addresses of more than 7,000 pharmaceutical companies in Europe and the Americas and 2,400 animal health companies worldwide.

PJB Pharmaceutical Industry News (PHIN)—the full text of four publications: *Scrip*, *Clinica*, *Animal Pharm*, and *Agrow*. These are international newsletters covering the pharmaceutical, device and diagnostic, veterinary, and agrochemical industries, respectively.

Political Risk Letter (FSRI)—full text of what was formerly Frost and Sullivan Political Risk Country Reports and currently part of International Business Communications. These reports assess the political and economic conditions in the 85 countries most important to international business.

Predicasts (PTSP, PTBI, PTFC, PTIN, PTAR, PTNP, PTMA, PTDT)—a collection of databases providing worldwide business information in a large range of markets and industries. The databases incorporate information from more than 2,000 international industry journals and newspapers covering all industries. The following databases are available:

Predicasts Promt (PTSP)—long summaries of substantive articles on markets and products, technological developments, and company activities.

Predicasts Business and Industry News (PTBI)—business and industry information from the world's core business publications, updated daily.

Predicasts Forecasts (PTFC)—published numeric forecasts on products, industries, demographics, and national incomes worldwide.

Predicasts Time Series (PTTS)—annual historic data for products and industries worldwide.

Predicasts Indexes (PTIN)—summarizes a wide range of articles not available in the *Promt* database, particularly in the areas of company financial information, macroeconomic information, and news of developing countries.

Predicasts Annual Reports (PTAR)—comprehensive coverage of annual reports of U.S. publicly held companies and selected international companies.

Predicasts Marketing and Advertising Service (PTMA)—advertising, marketing, and public relations information including advertising techniques and campaigns, new products and product strategies, consumer research, slogans, clients, and agencies.

Predicasts New Product Announcements (PTNP)—detailed press releases or announcements issued by companies or their agents that publicize and describe, in depth, new product introductions or modifications, new technologies, and new processes.

Predicasts Defense Markets and Technology (PTDT)—defense industry information, covering the full range of defense-related subjects: land, sea, and air weapon systems, technologies, products, and markets.

Predicasts PTS Newsletters (PTBN)—provides access to the full text of a broad range of international, specialized business, and industry newsletters.

Public Affairs Information Service (PAIS)—policy-oriented literature in the social sciences, covering such fields as economics, political science, international relations, public administration, sociology, and demography. The database emphasizes factual and statistical information.

Societe Generale de Banque (SGBD)—documents on banking, economics and finance, banking systems, regulations and activities, international monetary problems, world financial markets, economic trends, industrial sectors, and Belgian and EEC legislation. The abstracts are drawn from 1,000 international sources.

Trade Statistics Database (TRADSTAT)—import and export statistics supplied by the statistics or customs offices of 14 countries.

Tradstat—contains import/export trade statistics on more than 17 reporting countries representing more than 90 percent of world trade.

Who Supplies What (WLWE)—provides information on 51,000 German companies and their products. Company details cover addresses and telephone/fax/telex numbers.

Who Makes Machinery (VDME)—contains references to mechanical engineering products manufactured and offered for sale by about 4,400 companies in Germany. Company information includes addresses and telephone/fax/telex numbers.

Chemical

The Agrochemicals Databank (AGRC)—information on all aspects of pesticides in agriculture. The database includes chemical, physical, analytical, general use, and toxicity data on the component chemicals that are included in agrochemical products used worldwide.

Analytical Abstracts (ANAB)—covers general, inorganic, organic, biochemical, pharmaceutical, food, agricultural, and environmental aspects of analytical chemistry and computer and instrumental applications in analysis.

Chemical Abstracts (CHEM)—summarizes new findings about reactions, chemical substances, materials, techniques, procedures, apparatus, properties, theories, and applications reported in the primary chemistry, chemistry-related, and chemical engineering literature. The information is classified into 80 subject groups covering biochemistry, organic chemical engineering, physical chemistry, and analytical chemistry.

Chemical Safety Newsbase (CSNB)—information on the health and safety effects of hazardous chemicals encountered in the chemical and allied industries and on the hazards encountered in all types of laboratories.

Chem-Intell Trade and Production Statistics (PLST)—annual trade and production figures for more than 100 organic and inorganic chemicals, including petrochemicals, fertilizers, polymers, and rubber.

Chemical Engineering Abstracts (CEAB)—intended for practicing chemical engineers, this database provides full coverage of published information worldwide, including full articles, reviews, technical items, and some book reviews.

Chemical Nomenclature (CNAM)—a companion file to *CHEMICAL Abstracts* and an essential aid to substance searching in the *CA-Search* database.

European Directory of Agrochemical Products (EDAP)—lists data on pesticide products registered in Europe for use in agriculture, horticulture, and pest control.

Food Science and Technology Abstracts (FSTA)—information on food science and technology from sources published worldwide.

The Kirk-Othmer Encyclopedia of Chemical Technology (KIRK)—the complete text of this 25-volume encyclopedia, which is considered the standard reference in the field of chemical technology.

Pollution Abstracts (POLL)—international literature on environmental science and technology. The database covers air and land pollution, toxicology and health, noise, radiation, and environmental action.

News Databases

Kyodo News Service (KYOP)—news of business activity in Japan and in Japanese companies outside Japan. The database includes results, investment plans, and products and trades, as well as financial details, currency rates, closing stock prices, and comment on the day's market events.

PRESS—contains daily abstracts from the newspapers *USA Today* and *German Press.*

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Reference Databases

Academic American Encyclopedia Database (ENCY)—a 10-million-word encyclopedia database including more than 31,000 articles; approximately 13,000 articles include bibliographies.

Technology

Compendex (COMP)—the database version of the publication *Engineering Index Monthly*. The database covers the traditional engineering disciplines including civil engineering; mining, metal, and petroleum engineering; mechanical and automotive engineering; chemical engineering, electrical engineering and electronics; and environmental engineering. The database also features literature from the engineering-related areas of science and management including consumer attitudes, business machines, biotechnology, personnel, mathematics, environmental pollution, information retrieval systems, food processing and packaging, petroleum refining and transportation, law, government, textiles, agriculture, and ergonomics.

DKF Database (TDKF)—contains information on vehicle tests taken from approximately 70 international journals.

Engineering & Industrial Software Directory (EISD)—a guide to the most current publicly available software packages for engineering, manufacturing, and industrial applications.

Engineering Meetings (EIEM)—published conference proceedings relating to computer, electrical, chemical, and industrial engineering.

Inspec (INSP)—a major source of worldwide information on all aspects of physics, electrical engineering, electronics, computers, and control equipment.

ISIS Software database (ISIS)—descriptions of computer programs for industry-specific and industry-wide commercial, technical, and scientific applications available in the Federal Republic of Germany, Austria, and Switzerland.

Metadex (META)—covers the worldwide literature in the science and technology of metals and their alloys.

Ntis (NTIS)—synopses of documents available through the U.S. National Technical Information Service (NTIS). NTIS is the central source for the public sale of documents prepared by U.S. federal agencies or their contractors or by special technology groups.

Umweltbundesamt Umplis (ULIT)—environmental information including water, land, and atmospheric pollution through waste, fumes, noise, chemicals, etc. The database also includes documents on general environmental policies on rural and urban development, ecology, environmental aspects of energy resources, agriculture, forestry, fishing, and the food industry.

Volkswagenwerk (VWWW)—information on the automobile and transportation industries and the field of automobile technology. The database covers information on the technical, technological, economic, and business decisions emanating from the transportation industry. It also includes information from subcontractors to the automobile industry (e.g., plastics, electronics).

Free Training Files

Data-Star offers the following databases for training purposes. They can be accessed at no charge.

TRCH—for chemical information (part of the *Chemical Abstracts* database).

TREM—for biomedical/drug information (part of the *Excerpta Medica* database).

TRIC—for company information (part of the *ICC Companies* database).

TRIN—for engineering and technology (part of the *INSPEC* database).

TRME—for medical information (part of the *MEDLINE* database).

TRPH—for drug development information (part of the *Pharmaprojects* database).

TRPI—for health care business news (part of the *Pharmaceutical Industry News* database).

TRPT—for business information (part of the *Predicasts PROMT* database).

TRSC—for worldwide scientific literature (part of the *SciSearch* database).

TRST—for in-depth company and industry analysis (part of the *InvesText* database).

TRTO—for toxicological information (part of the *Toxline* database).

Miscellaneous

Data-Star Service Databases—Data-Star offers three databases that describe various aspects of its on-line service. They are:

News—includes descriptions of all Data-Star databases, including search details; announcements, seminar schedules, and contacts; and pricing information for each database.

Data-Star

CROS—enables the user to scan all databases in a particular field (e.g., business) or to scan his/her own selection of databases to determine the one most relevant to the topic.

ACCT—includes details of use and allows the subscriber to check or change his/her mailing address, user profile, or security password.

Pricing

There are no sign-up fees or subscription fees for using the Data-Star service. Customers are billed strictly on a "pay-as-you-go" basis. As with most database vendors, the cost of searching on Data-Star varies with the database that's being accessed. The company, however, put a 12-hour discount policy into effect in September 1988. This provides customers a substantial price reduction ($20 per connect hour discount for most files) for searching between the hours of 1 p.m. and 1 a.m., Eastern time.

See Data-Star's North American Price List (Table 1) for pricing information. In addition, up-to-the-minute pricing information is available on-line.

FUTURE PLANS

Data-Star plans to add additional files in the two areas that its service emphasizes—business and biomedicine. It also plans to make its electronic mail service more widely available.

Data-Star

TABLE 1. DATA-STAR'S NORTH AMERICAN PRICE LIST (EFFECTIVE JANUARY 1989)

Database Name	Label	Connect Time per Hour ($)	Print or Display (per full record) On-Line ($)	Print or Display (per full record) Off-Line ($)	SDI Charges Profile ($)	SDI Charges Citation ($)
Biology/Medicine						
AIDS Database	AIDS	79.00	0.66	0.60	2.67	0.60
Biosis Previews	BIOL	91.00	0.39	0.37	4.19	0.37
Biosis Previews Vocabulary File	BVOC	91.00	0.00	0.37	—	—
British Medical Assoc. Press Cuttings	BMAP	54.00	0.00	0.07	—	—
Cancer Literature†	CANC	34.00	0.07	0.13	2.67	0.13
Current Biotechnology Abstracts	CUBI	91.00	0.81	0.54	5.19	0.54
Department of Health & Social Security	DHSS	80.00	0.16	0.45	2.67	0.45
DIOGENES	DIOG	124.00	1.50	—	—	—
Excerpta Medica	EMED	80.00	0.50	0.31	10.13	0.31
Excerpta Medica Vocabulary	EVOC	80.00	0.00	0.31	—	—
FDC Reports	FDCR	114.00	0.99	1.14	4.67	1.14
Forensic Science Database	FORS	62.00	0.22	0.36	—	—
General Practitioner	GPGP	62.00	0.40	0.90	—	—
HSELINE	HSLI	66.00	0.22	0.20	4.47	0.20
IDIS Drug File	IOWA	52.00	0.33	0.43	3.67	0.43
International Pharmaceutical Abstracts	IPAB	69.00	0.33	0.26	4.67	0.26
IRCS Medical Science	IRCS	64.00	0.66	—	—	—
Kosmet	KOSM	80.00	0.77	0.90	5.33	0.90
Martindale (The Extra Pharmacopoeia)	MART	64.00	0.66	0.50	—	—
Medline†	MEDL	34.00	0.07	0.13	2.67	0.13
Medline Vocabulary†	MVOC	34.00	0.07	0.13	—	—
Nursing & Allied Health	NAHL	64.00	0.22	0.20	2.67	0.20
Pharmaprojects	PHAR					
—Subscribers		133.00	0.97	1.13	—	—
—Nonsubscribers		133.00	40.00	40.00	—	—
Pharmaprojects Discontinued Drugs	PHDI					
—Subscribers		133.00	0.97	1.13	—	—
—Nonsubscribers		133.00	40.00	40.00	—	—
Pharmaceutical Industry News (Scrip)	PHIN	133.00	0.63	0.93	—	—
—Last 2 Weeks	PHIC	133.00	2.47	2.67	—	—
—Daily update—today	PHID	133.00	2.47	2.67	—	—
Pharmacontacts	PHCO	133.00	1.00	0.57	—	—
Pharmline	LINE	89.00	0.34	0.29	2.67	0.29
Pre-Med	PREM	74.00	0.16	0.11	—	—
Psychological Abstracts	PSYC	63.00	0.41	0.15	3.67	0.10
Science Citation Index	SCIN					
—Subscribers		69.00	0.37	0.36	4.17	0.36
—Nonsubscribers		139.00	0.37	0.36	4.17	0.36
Sciscan	SCCC	94.00	0.31	0.41	4.17	0.41
Side Effects of Drugs	SEDB	81.00	3.37	3.30	—	—
Sociological Abstracts	SOCA	69.00	0.26	0.30	3.67	0.30
Toxline†	TOXL	34.00	0.07	0.13	2.65	0.13
Business						
ABI/Inform	INFO	99.00	0.62	0.85	2.67	0.85
Abstracts in Biocommerce	CELL	107.00	0.61	0.45	2.67	0.45
American Banker	BANK	74.00	0.41	0.35	—	—
BioBusiness	BBUS	99.00	0.44	0.37	4.19	0.37
Infomat International Business	EBUS	88.00	0.87	0.80	4.67	0.80
Business Opportunities	BUSI	111.00	0.53	0.63	8.00	0.63
Business & Professional Software	SOFT	89.00	0.66	0.65	2.67	0.65
Chemical Business Newsbase	CBNB	159.00	1.66	1.08	7.17	1.08
Chemical Industry Notes	CIND	96.00	0.50	0.55	6.67	0.55
Chemical Plants Worldwide	PLAN	62.00	2.05	1.98	2.67	1.98
Chemical Trade & Production Statistics	PLST	53.00	18.00	18.00	2.67	18.00
COIN-Numeric	COIN	71.00	23.67	23.67	6.72	23.67

†Medline, Cancerlit, and Toxline are presented on DATA-STAR in cooperation with the Swiss Academy of Medical Sciences as partner of the National Library of Medicine.

*Price per TX paragraph. Take care when printing paragraphs in full-text databases. If you enter the command . . . P/All/1, you will be charged for all the text paragraphs even if you interrupt printing.

**Charges for these databases may differ due to variable paragraph prices. See the NEWS database for full details of the cost of individual paragraphs, or telephone the Help-Desk.

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TABLE 1. DATA-STAR'S NORTH AMERICAN PRICE LIST (EFFECTIVE JANUARY 1989) (Continued)

Database Name	Label	Connect Time per Hour ($)	Print or Display (per full record) On-Line ($)	Print or Display (per full record) Off-Line ($)	SDI Charges Profile ($)	SDI Charges Citation ($)
Business (Continued)						
Computer Database	CMPT	90.00	0.73	0.65	2.67	0.65
Creditreform	DVVC	112.00	**			
Disclosure	DISC	64.00	**	**		
European Chemical News	CNEW	152.00	0.68	0.97		
—Latest Update	CNEX	152.00	1.84	2.34	2.67	2.34
Fairbase—International Trade Fairs	FAIR	127.00	0.93	1.00	5.73	1.00
Financial Times Company Abstracts	FNTL	84.00	0.96	1.00	4.67	1.00
Financial Times Business Reports	FTBR	84.00	0.96	1.25	4.67	1.25
FINF-Text	FITT	131.00	0.40	0.40	6.67	0.40
FIZ-Technik German Databases						
ABC West Germany	ABCE	134.00	1.23	1.39	—	—
The German Industry	BDIE	134.00	1.49	1.65	—	—
German Buyers Guide	E1X1	134.00	1.23	1.39	—	—
ABC Europe	EURE	134.00	1.23	1.39	—	—
Measurement Machinery	MRAE	134.00	1.23	1.39	—	—
Who Makes Machinery?	VDME	134.00	1.23	1.39	—	—
Who Supplies What?	WLWE	134.00	1.23	1.39	—	—
Electro/Electronics	ZVEE	134.00	1.49	1.65	—	—
Foreign Trade & Economic Abstracts	IEAB	94.00	0.31	0.35	2.67	0.35
Frost & Sullivan Political Risk	FSRI	104.00	5.00*	—	—	—
—Subscribers		44.00	0.50*	—	—	—
Frost & Sullivan Market Studies	FSFS	57.00	0.43	0.30		
Harfax Industry Data Sources	HARF	81.50	0.11	0.40	2.67	0.40
Harvard Business Review	HBRO	99.00	0.00			
Hoppenstedt Austria—Companies	HOAU	160.00	**	**	—	—
Hoppenstedt Germany—Companies	HOPE	160.00	**	**	—	—
Hoppenstedt Netherlands—Companies	HONL	160.00	1.13	0.90		
ICC Brokers Research	ICBR	104.00	4.00*	—	—	—
ICC Canadian Corporations	ICCA	104.00	**	—	—	—
ICC Keynotes Industry Analysis	ICKN	104.00	6.67*	6.67*	—	—
ICC UK Companies Database	ICUK	104.00	**	—	—	—
Investext	INVE	119.00	4.95*	4.32*	—	—
ISIS Software	ISIS	134.00	2.08	2.24	—	—
Management Contents	MGMT	84.00	0.48	0.55	2.67	0.55
Materials Business File	MBUS	84.00	0.36	0.45	4.67	0.45
Petroleum/Energy Business News Index	PEAB					
—Supporters		74.00	0.22	0.16	—	—
—Nonsupporters		74.00	0.32	0.26	—	—
Pharmaprojects	PHAR					
—Subscribers		133.00	0.97	1.13	—	—
—Nonsubscribers		133.00	40.00	40.00	—	—
Pharmaprojects Discontinued Drugs	PHDI					
—Subscribers		133.00	0.97	1.13	—	—
—Nonsubscribers		133.00	40.00	40.00	—	—
Pharmaceutical Industry News (Scrip)	PHIN	133.00	0.63	0.93	—	—
—Last 2 Weeks	PHIC	133.00	2.47	2.67	—	—
—Daily update—today	PHID	133.00	2.47	2.67	—	—
Pharmacontacts	PHCO	133.00	1.00	0.57	—	—
Predicasts Annual Reports	PTAR	109.00	0.55	0.65	—	—
Predicasts Business Newsletters	PTBN	104.00	**	**	—	—
Predicasts Defense Markets & Tech.	PTDT	119.00	0.60	0.70	4.67	0.70
Predicasts Forecasts	PTFC	109.00	0.40	0.30	—	—
Predicasts Indexes	PTIN	109.00	0.35	0.33	4.67	0.33
Predicasts MARS	PTMA	119.00	0.55	0.55	4.67	0.55

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TABLE 1. DATA-STAR'S NORTH AMERICAN PRICE LIST (EFFECTIVE JANUARY 1989) (Continued)

Database Name	Label	Connect Time per Hour ($)	Print or Display (per full record)		SDI Charges	
			On-Line ($)	Off-Line ($)	Profile ($)	Citation ($)
Business (Continued)						
Predicasts New Product Announce.	PTNP	109.00	0.65	1.45	4.67	1.45
Predicasts PROMT	PTSP	114.00	0.65	0.65	4.67	0.65
Predicasts Time Series	PTTS	109.00	0.40	0.40	—	—
Predicasts Super Label	PTZZ	114.00	0.65	0.65	—	—
Public Affairs Information Services	PAIS	74.00	0.26	0.23	5.17	0.23
Société Générale de Banque	SGBD	84.00	0.13	0.33	—	—
Chemical						
Agrochemicals Databank	AGRC	177.20	2.07	1.17	5.37	1.17
Analytical Abstracts	ANAB	96.00	0.92	0.59	5.19	0.59
Chemical Abstracts—Search	CHEM	96.00	0.52	0.57	6.67	0.57
Chemical Abstracts—Nomenclature	CNAM	166.00	0.51	0.50	9.67	0.50
Chemical Engineering Abstracts	CEAB	96.00	0.81	0.47	5.01	0.47
Chemical Safety Newsbase	CSNB	91.00	0.81	0.54	5.19	0.81
East European Chemical Monitor	EECM	134.00	0.56	0.70	—	—
European Agrochemical Products	EDAP	213.00	2.02	1.17	—	—
Food Science & Technical Abstracts	FSTA	84.00	0.27	0.25	3.67	0.25
ICIS-LOR Oil & Chemical Reports	LORS	44.00	1.00	—	—	—
—Daily Update	LORD	44.00	4.00	—	—	—
Kirk-Othmer Encyclopedia	KIRK	99.00	—	—	—	—
News Databases						
KYODO News Service	KYOP	93.00	0.67	0.67	—	—
SDAA Swiss News Agency (French)	ATSA	89.00	0.37	0.57	5.67	0.57
SDAA Swiss News Agency (German)	SDAA	89.00	0.37	0.57	5.67	0.57
Reference Databases						
Academic American Encyclopedia	ENCY	54.00	0.00	0.30	—	—
Cuadra Directory	CUAD	69.00	0.66	0.70	—	—
Technology						
El Compendex	COMP	109.00	0.43	0.42	4.92	0.35
El Engineering Meetings	EIEM	109.00	0.43	0.42	4.92	0.35
El Software Directory	EISD	74.00	0.91	1.00	—	—
Inspec	INSP	98.00	0.50	0.49	7.71	0.49
Metadex	META	84.00	0.36	0.45	4.67	0.45
National Technical Info. Service	NTIS	79.00	0.42	0.45	3.52	0.45
Pollution Abstracts	POLL	79.00	0.41	0.40	2.67	0.40
UMPLIS Umweltliteraturedatenbank	ULIT	74.00	0.27	0.30	3.33	0.30
UMPLIS Umweltforschungsdatenbank	UFOR	74.00	0.27	0.30	3.33	0.30
Volkswagenwerk AG	VWWW	116.00	0.50	0.64	5.33	0.64
Free Training Files						
Chemical Abstracts	TRCH	FREE	FREE			
Excerpta Medica	TREM	FREE	FREE			
ICC Companies	TRIC	FREE	FREE			
INSPEC	TRIN	FREE	FREE			
INVESTEXT	TRST	FREE	FREE			
Medline	TRME	FREE	FREE			
Pharmaprojects	TRPH	FREE	FREE			
Pharmaceutical Industry News (Scrip)	TRPI	FREE	FREE			

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TABLE 1. DATA-STAR'S NORTH AMERICAN PRICE LIST (EFFECTIVE JANUARY 1989) (Continued)

Database Name	Label	Connect Time per Hour ($)	Print or Display (per full record)		SDI Charges	
			On-Line ($)	Off-Line ($)	Profile ($)	Citation ($)
Free Training Files (Continued)						
Predicasts PROMT	TRPT	FREE	FREE			
Scisearch	TRSC	FREE	FREE			
System Files						
News	NEWS	44.00	1.00			
Cross	CROS	44.00				
Account	ACCT	44.00				
Official Airline Guide						
OAG	OAG	1.00 per minute				
USA TODAY	PRESUSAD		20.00			
GERMAN PRESS	PRESSDAD		20.00			

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The following print formats are available:

. . P FREE	prints all free paragraphs
. . P SHORT	prints AN, TI, AU, SO
. . P MEDIUM	prints AN, TI, AU, SO, AB
. . P LONG	prints AN, TI, AU, SO, AB, DE

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DataTimes Corporation

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Synopsis

Editor's Note

DataTimes provides on-line access to numerous databases, including newspaper files, wire services, and region-specific databases. Since our last update, DataTimes has added at least 15 new newspapers to its service. The databases are still accessible via the Telenet, now called SprintNet, packet-switching network. Its pricing structure has been modified so that the users have two options for accessing services.

DataTimes still offers global searches, Dow Jones News/Retrieval, and a variety of international databases. Communication fees are charged separately at $0.17 per minute, while international communication fees vary depending on the country being accessed. (For more details on DataTimes' pricing, see the section on Pricing Information in this report.) DataTimes continues to offer first-time users its customer support services, including free on-site training when possible or free on-line time for subscribers not near a local DataTimes office.

Report Highlights

DataTimes' newspaper databases cover the United States, Asia, Australia, Canada, Europe, and the Middle East. Through a gateway established in November 1986, more than 50 Dow Jones News/Retrieval databases are also offered to DataTimes' subscribers. Within the U.S., papers such as *The Dallas Morning News*, *The Washington Post*, and the *Chicago Tribune* are all available in full text. DataTimes now offers the *Courier Mail/Telegraph* and the *Sunday Mail* from Australia, which cover the Gold Coast, industry, tourism, high technology, government, and commerce. Approximately 15 Canadian newspapers also have been added. Aside from the ever growing number of on-line databases, DataTimes also provides electronic library services and management services for a number of publishers throughout the United States.

Vendor

DataTimes Corp.
14000 Quail Springs Parkway, Suite 450
Oklahoma City, OK 73134
(405) 751-6400, (800) 642-2525
In Canada, contact the U.S. office.

Analysis

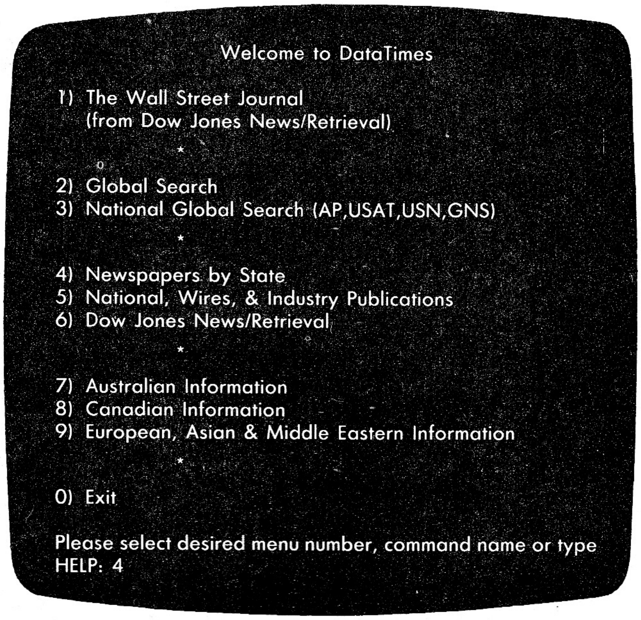
DataTimes Corporation offers on-line access to regional, national, and international newspapers through its DataTimes division. Currently, DataTimes provides access to the full text of about 35 metropolitan newspaper databases, including *The Chicago Sun-Times*, *The San Francisco Chronicle*, and *The Dallas Morning News*, as well as the AP newswire and *Congressional Quarterly Weekly*. In addition, through a gateway, DataTimes offers access to over 40 databases available through Dow Jones News/Retrieval, including *The Wall Street Journal*. Through a gateway arrangement with PROFILE information, DataTimes offers international files from Europe, Asia, and the Middle East.

DataTimes is a division of the Oklahoma Publishing Company, one of the largest privately owned media conglomerates in the U.S.

Company Background

DataTimes Corporation, one of only two U.S. companies specializing in on-line access to newspapers, was founded in 1979. In 1983, the company was acquired by the Oklahoma Publishing Company (OPUBCO) to provide on-line support and marketing services for the electronic library database of *The Daily Oklahoman and Times*. OPUBCO's holdings include television and radio stations, the Opryland Hotel and Theme Park, and newspapers. Together with Dow Jones, OPUBCO also owns 52 percent of Telerate Systems Inc., which provides an electronic information service to the financial community.

DataTimes provides on-line access to the full text of national, international, and regional newspapers and wire services and specialized regional databases. DataTimes is available throughout the continental United States, Hawaii, Canada, and Europe. Users can access DataTimes' databases through any modem-equipped ASCII terminal or microcomputer via the SprintNet (formerly Telenet) network. All DataTimes' newspaper and wire service databases are available in both full-text and abstract form.



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                Welcome to DataTimes

1) The Wall Street Journal
   (from Dow Jones News/Retrieval)
                    *

2) Global Search
3) National Global Search (AP,USAT,USN,GNS)
                    *

4) Newspapers by State
5) National, Wires, & Industry Publications
6) Dow Jones News/Retrieval
                    *

7) Australian Information
8) Canadian Information
9) European, Asian & Middle Eastern Information
                    *

0) Exit

Please select desired menu number, command name or type
HELP: 4
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DataTimes' welcome screen offers many options including Dow Jones News/Retrieval.

Through a gateway established in November 1986, more than 50 databases offered by Dow Jones News/Retrieval are now available to DataTimes subscribers. Also, DataTimes Corporation and Queensland Newspapers Pty. Ltd. (Brisbane, Australia) recently launched an international newspaper library retrieval service. The service allows Australian on-line users to access the DataTimes newspaper library network and allows DataTimes' customers to access the largest Australian newspaper database.

DataTimes has marketing and support offices nationwide. Corporate offices are located in Oklahoma City, with branch offices in San Francisco and Dallas.

Competitive Position

Companies in most industries experience head-to-head competition, but on-line service providers seem to have more than their fair share. Notable examples include NEXIS, DIALOG, and VU/TEXT. As an on-line company specializing in providing on-line access to newspapers, DataTimes competes primarily against Knight-Ridder's VU/TEXT.

VU/TEXT is the older of the two companies and had first crack at putting K-R papers on-line. It also offers other, nonnewspaper files, such as most of the Time-Life publications. While VU/TEXT has been one of the market leaders, DataTimes continues to strengthen its offerings and is a solid competitor. DataTimes also has a solid relationship with newspaper giant Gannett and offers Gannett databases on-line, including the Gannett News Service, and several newspapers, including the popular *USA Today*. In addition, DataTimes offers a gateway to Dow Jones News/Retrieval, giving DataTimes subscribers on-line access to *Barron's Business & Financial Weekly*, *Business Dateline*, *The Business Library*, *Business Week*, *Dow Jones News* (Archive), *McGraw-Hill Library*, *The Wall Street Journal*, *Summary of Databases*, and *Industry/Government Codes*.

VU/TEXT's parent company, Knight-Ridder, recently bought the on-line industry's leading company, DIALOG. Naturally, this can only benefit VU/TEXT. (For example, a gateway between DIALOG and VU/TEXT, which would allow subscribers of one service to access files from the other [as a menu option], would essentially add more than 300 databases to VU/TEXT's tally.) As long as DataTimes remains the sole provider of some files, however, it will continue attracting customers needing on-line access to those files.

Resources and Facilities

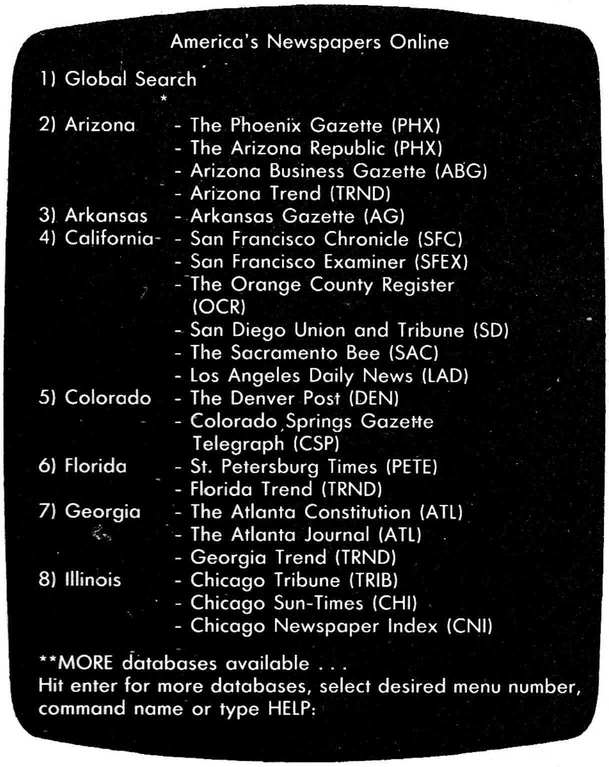
Processing Center

DataTimes' primary data center, located in Oklahoma City, houses Digital VAX 785 superminicomputers. These systems are clustered and provide complete redundancy. DataTimes also has on-site installations at newspapers in Dallas, TX; Baton Rouge, LA; Hackensack, NJ; Harrisburg, PA; Washington, DC; Houston, TX; Seattle, WA; and Reading, PA.

Systems Software

Operating System: DataTimes uses the VAX VMS operating system.

Data and Database Management: DataTimes uses BASIS search and retrieval software for database maintenance, access, and search capabilities. BASIS allows users to search any word or combination of words, since virtually every word is indexed by the software.



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                    America's Newspapers Online
1) Global Search

2) Arizona      - The Phoenix Gazette (PHX)
                - The Arizona Republic (PHX)
                - Arizona Business Gazette (ABG)
                - Arizona Trend (TRND)
3) Arkansas     - Arkansas Gazette (AG)
4) California-  - San Francisco Chronicle (SFC)
                - San Francisco Examiner (SFEX)
                - The Orange County Register
                  (OCR)
                - San Diego Union and Tribune (SD)
                - The Sacramento Bee (SAC)
                - Los Angeles Daily News (LAD)
5) Colorado     - The Denver Post (DEN)
                - Colorado Springs Gazette
                  Telegraph (CSP)
6) Florida      - St. Petersburg Times (PETE)
                - Florida Trend (TRND)
7) Georgia      - The Atlanta Constitution (ATL)
                - The Atlanta Journal (ATL)
                - Georgia Trend (TRND)
8) Illinois     - Chicago Tribune (TRIB)
                - Chicago Sun-Times (CHI)
                - Chicago Newspaper Index (CNI)

**MORE databases available . . .
Hit enter for more databases, select desired menu number,
command name or type HELP:
```

After choosing Option 4 from the welcome screen, DataTimes offers not only global searching, but newspapers on-line from around the United States.

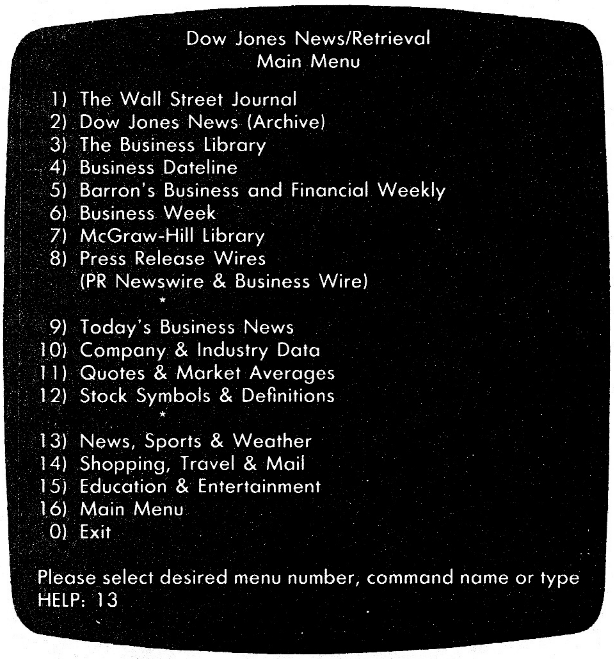
BASIS was developed by Battelle Institute, a research and development organization located in Columbus, OH. The software is installed in over 400 sites worldwide.

Customer Support Services

DataTimes provides numerous customer support services, including user guides, free on-site training (when possible), or free on-line time for subscribers not near a local DataTimes office. DataTimes also has an 800 hot line and provides quarterly newsletters and updates to subscribers.

Sales and Marketing Services

DataTimes is marketed nationwide through direct sales, trade shows, print advertising, direct mail, and telemarketing. DataTimes' sales and marketing offices are located in Oklahoma City, Dallas, and San Francisco.



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              Dow Jones News/Retrieval
                     Main Menu

 1) The Wall Street Journal
 2) Dow Jones News (Archive)
 3) The Business Library
 4) Business Dateline
 5) Barron's Business and Financial Weekly
 6) Business Week
 7) McGraw-Hill Library
 8) Press Release Wires
    (PR Newswire & Business Wire)
              *
 9) Today's Business News
10) Company & Industry Data
11) Quotes & Market Averages
12) Stock Symbols & Definitions
              *
13) News, Sports & Weather
14) Shopping, Travel & Mail
15) Education & Entertainment
16) Main Menu
 0) Exit

Please select desired menu number, command name or type
HELP: 13
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DataTimes' Dow Jones News/Retrieval main menu.

On-Line Databases

DataTimes provides on-line access to numerous databases, including newspaper files, wire services, and region-specific databases. All newspaper and wire service databases are updated daily. All databases are available in full-text and abbreviated form.

The following features apply to all DataTimes databases:

- A search can be performed on individuals, companies, or subjects using any word or combination of words.
- Proximity connectors allow combinations of terms within words or within the same sentence or paragraph.
- Boolean connectors such as "and", "or", and "not" can be used.
- Users can narrow searches to meet their needs through "field searching" (e.g., only stories with "solar energy" in the headline).
- Through date searching, users can search across many years of information or within a specific day, week, or month.
- Searches can be displayed in full-text, abstract, or field-specific form.
- Searches can be saved and combined.
- On-line or off-line printing capabilities are available.
- Search terms can be truncated for variations of roots.
- An on-line thesaurus is available for some databases.
- Some databases contain key words or subject terms to provide alternative ways of searching.

Brief descriptions of DataTimes' databases follow. Many of these databases are profiled in depth in the On-line Databases section of this publication (Tab OL40).

United States

American Banker	The premier banking and financial services daily newspaper covering the local, national, and international financial services scene.
The Associated Press	Contains national and international stories. It provides current, comprehensive information covering business, sports, entertainment, and features. The service also includes the Washington, DC newswire.
Associated Press Political Service	Contains local, state, and national political news and statistics. The database is organized into three categories: biography, campaign story, and summary.
CMP Publications	Contains the text of 15 trade journals. The database is divided into six files. In the communications area it includes **CommunicationsWeek**, **CommunicationsWeek International**, and **InformationWeek**. In the computer area it includes **Computer Reseller News**, **Computer Systems News**, **Macintosh News**, **UNIX Today!**, and **VARBUSINESS**. In the consumer area it includes the **Long Island Monthly**. In electronics, it includes **Electronic Buyers News**, **Electronic Engineering Times**, and **High Performance Systems**. In health it includes **HealthWeek**, and finally in travel it includes **Business Travel News** and **Tour and Travel News**. Each journal may be accessed separately or as part of its file group.

Congressional Quarterly Weekly Report	Offers detailed, unbiased coverage of Congress: its legislative proposals, priorities, decisions, people and presidential relations—plus the judiciary, national politics, and interest group lobbying. Special reports cover preelection forecasts and postelection analyses, candidate and new member profiles, vote studies, and Supreme Court decisions.
Gannett News Service	Contains the full text of articles, with the exception of sports and business digests. All articles written by Gannett reporters and nonsyndicated free-lancers are saved, including special sections and investigative series.
USA Today	Contains the full text of articles by **USA Today** reporters and free-lancers in the News, Money, Sports, Life, and Bonus sections and in the USA Weekend Magazine. References to graphics, photos, and cartoons with available text are also provided. It covers material from April 1, 1987 to the present.
U.S. News & World Report	One of the premier news magazines in the country containing subject coverage of international affairs, politics, business, economics, health, Wall Street, and editorial comment. It contains material from June 13, 1988 to the present.
U.S. Newswire	The Washington-based wire service used to transmit news releases and statements from the federal government and other national newsmakers to the Washington press corps. Fifteen to twenty stories are added daily, and the material is available from fall 1989.
The Washington Post	One of the nation's leading newspapers with circulation in each of the 50 states. Articles cover a broad range of topics including national defense, environmental protection, economics and economic policy, legal issues, government regulation, international trade, and politics. There are about 300 articles added daily, and they are available within 24 to 48 hours of the publication.

Arizona

Arizona Trend	Offers comprehensive coverage of economics, finance, real estate, and business in the Sun Belt. The coverage is from September 1986 to August 1987. Regular columns discuss state and federal government, business statistics, public policy, real estate, fine dining, state history, and the media.

Arkansas

Arkansas Gazette	Provides coverage of specific statewide issues. The coverage in this database is from October 1984 to the present with approximately 125 stories updated daily. It includes the full text of all Arkansas-related articles.

California

The Orange County Register	Is California's third largest daily with a circulation of over 300,000. It services a population of more than 2 million persons living in a coastline county midway between Los Angeles and San Diego. The material covered in this database is from September 15, 1986 to the present, with approximately 200 articles added daily and available within 24 to 48 hours of publication.
The Sacramento Bee	Provides extensive coverage of state government news and events. The coverage is from November 8, 1988 to the present.
The San Diego Union/The Tribune	Provide coverage of international, national, California, and San Diego news with emphasis on Southern California, the U.S. Navy, the International Border, and Latin America. It contains the full text of all printed new articles including wire stories. Coverage is from January 1986 to the present.
San Francisco Chronicle	Offers a comprehensive source of information on computer, semiconductor, biotechnology, robotics, and other high-technology industries in the San Francisco Bay Area, which includes Silicon Valley. Approximately 200 stories are added daily, with coverage from January 1985 to the present.

Colorado

Colorado Springs Gazette Telegraph	Provides exclusive coverage of local news, issues, and events. Local facilities include the North American Aerospace Defense Command, the U.S. Space Command, the Strategic Defense initiative's National Test Facility, the headquarters of the U.S. Olympic Committee, and the Olympic Training Center. Coverage is from April 2, 1988 to the present. It includes the full text of all locally produced material except schedules and menus. All wire stories concerning Colorado are also saved.
The Denver Post	Coverage spans from June 1, 1989 to the present, capturing such important areas as brewing, manufacturing, defense, communications, oil and gas, and recreation.

Florida

Florida Trend	Offers coverage of economics, finance, real estate, and business in the Sun Belt. Coverage spans from July 1986 to the present with approximately 75 stories added daily. Also included is the full text of all news articles and columns.
St. Petersburg Times	The second largest circulation daily in Florida, with approximately 225 articles added daily. Its reporting strength reaches past its primary coverage area on the West Coast of Florida with correspondents throughout the world. It also contains all locally written items and selected wire items.

Georgia

Georgia Trend	Offers coverage of economics, finance, real estate, and business in the Sun Belt. The issues contain interviews and profiles of influential business leaders and corporations as well as in-depth analyses of economic trends. The full text of all news articles and columns is included, with approximately 75 stories added monthly. Coverage is from November 1986 to the present.

Illinois

The Pantagraph	Covers a large area of the state of Illinois. It includes the full text of all articles with approximately 90 articles added daily. The coverage of information is from January 1, 1989 to the present.
Chicago Newspaper Index	Created by the Sun-Times and indexes the Sun-Times from January 1976 through June 1985, when full text of the Sun-Times became available on DataTimes. Entries include newspaper name, page number, headline, publication date, edition, and keywords from the article. Coverage is from January 1976 to June 1985. *CNI* contains approximately 615,000 index entries from three Chicago newspapers. It is archival and not upated.
The Chicago Sun-Times	Offers coverage of news, business, political and social issues, and local and regional events of the Chicago metro area and the Midwest. It contains the full text of all articles, except sports statistics, announcements of local interest, and stock tables. Approximately 185 stories are added daily with coverage from July 1985 to the present.
The Chicago Tribune	Provides local, national, and international coverage. Emphasis is on business news, politics, government, cultural affairs, urban and social issues, sports, criticism, and comment. The full text of all articles is included. Business and sports statistical tables and certain minor items are not included. Coverage is from January 1989 to the present. It is available daily with articles available 24 hours after publication.

Kentucky

The Courier-Journal	Coverage includes such areas as business, industry, economics, and medicine. The sports section provides coverage of horse racing and the horse industry. This database also provides coverage of the tobacco, liquor, and auto industries. Coverage is daily from April 1, 1988 to the present with about 170 stories per day and 185 on Sunday. The full text of all articles with the exception of advice columns is available. All editions of a story are compared, and only the most definitive version is saved.
The Daily Record	A legal daily published Monday through Friday. It contains real estate transfers and mortgages, bankruptcies, federal and state tax liens and releases, lists pendens and releases, judgments liens and releases, mechanic liens and releases, births, deaths, marriages and probates, and circuit court civil suits for Jefferson County. Coverage is from fall 1989, with all printed news articles and legal information available.

Louisiana

Baton Rouge State-Times/Morning Advocate	Offer detailed coverage of state, regional, and local government news, sports, business, entertainment, food, arts, weather, consumer affairs, education, health care, community issues, politics, elections, courts, crime, law enforcement, and much more. The full text of all printed articles that pertain to or would be of interest to Louisiana is available. District court records and property transfers from East Baton Rouge Parish, births, and the Legislative Bill Digest are also available.

Massachusetts

Telegram & Gazette	Offers detailed coverage of issues pertinent to Central Massachusetts. It provides in-depth coverage of subjects such as medicine, health care, business, the arts, environmental issues, high technology, government, and politics. The full text of all articles is included with about 100 articles added daily.

Minnesota

Star Tribune	The largest newspaper in Minnesota and the five surrounding states. The newspaper has a daily circulation of 385,000 and a Sunday circulation of over 600,000. All articles are saved except self-help columns such as *Dear Abby*. If multiple versions of a story are printed, only the most recent is kept. The coverage is from January 1986 to the present with about 150 stories daily which are available within 48 hours of publication.

New Jersey

The Bergen Record	Offers coverage of state and regional news including the New York Metropolitan Area. It provides detailed coverage of economic, political, and social developments in Northern New Jersey with an emphasis on Bergen, Essex, Hudson, Morris, and Passaic Counties. It contains the full text of all stories including wire stories and syndicated columns except for the following: stock, financial, and weather tables; weddings and engagements; lists and announcements of upcoming events; sports statistics and roundup stories.
The Star-Ledger	Covers the business news of Newark and surrounding areas. Areas of special interest covered in the pages of this paper are banking, finance, industry, shipping, politics, and environmental issues. The full text of all local news articles is included in this database. Coverage is from May 1989 to the present with about 100 stories added daily.

New York

Newsday/New York Newsday	The largest evening paper and the sixth largest newspaper in the United States. The full text of all articles from *Newsday* and *New York Newsday* with the exception of advice columns, calendars, listings, and agate. More than one version of a story may be saved if that story varies from earlier editions. There are approximately 225 stories added daily, with coverage from October 1985 to the present.

Oklahoma

The Daily Oklahoman	The state's largest and leading newspaper. The database includes information on Oklahoma politics and important energy and agricultural issues. Coverage is from November 1981 to the present with about 125 stories updated daily.
The Journal Record	Covers primarily business news in Oklahoma and Oklahoma City. It publishes courthouse filings that are critical to credit decisions which include but are not limited to federal and county courthouse cases filed, bankruptcy filings, judgments, mortgages, warranty deeds, quit claim deeds, sheriff sales, oil and gas information, tax liens, and mechanic liens. Approximately 40 business news articles are added daily, with coverage from April 1985 to the present.
The Oklahoman and Times Microfilm Index	Indexes newspaper clippings from approximately 1965 to November 1982. There are about 190,000 name or subject listings. The microfilm itself is available at the Oklahoma County Metropolitan Library. The database contains over 1,000,000 references.
The Tulsa Tribune	Offers coverage of Tulsa, OK, western Arkansas, and southern Kansas. Local industries covered include energy, aerospace, computer, health care/medical services, and financial services.
Tulsa World	Provides coverage of Tulsa, northeastern Oklahoma, western Arkansas, southern Kansas, and southwestern Missouri. In addition to general news, the *World* offers coverage of local business news, including the oil and aerospace industries, and local, state, and national sports. The full text of all articles is included with coverage from January 1, 1989 to the present.

Ohio

The Plain Dealer	Reports on manufacturing, service, medicine, finance, research, and technology. The full text of all local news articles and articles with an Ohio dateline are included. Information covered is from March 27, 1989 to the present.

Oregon

The Oregonian	Covers the Pacific Northwest and related areas of interest such as importing, exporting, forestry, electronics, shipping, and environmental issues. It became available in August 1989.

Pennsylvania

The Harrisbug Patriot/The Evening News	Contains the full text of local stories dealing with South Central Pennsylvania and those stories concerning the Pennsylvania government. Approximately 110 articles are added daily with coverage from August 1986 to the present.
Reading Eagle/Reading Times	Both papers serve an eight-county area of Mid-Eastern Pennsylvania centered on Reading, the county seat of Berks County. Local spot news reporting blends with feature writing and expanded sports and business sections to serve this area between Philadelphia, Harrisburg, Allentown, and Lancaster. All locally written items and selected wire items are included in the database. There are about 100 stories added daily which are available within 24 to 48 hours of publication. The coverage is from January 1987 to the present.

Texas

Austin American-Statesman	Offers coverage of local news, sports, business, arts, and entertainment for Austin and surrounding areas. The coverage is from January 1989 to the present with approximately 150 articles added daily. The full text of all articles is included in this database.
The Daily Texan	Contains political coverage from the state capital in Texas as well as stories about current trends academically and socially on a major university campus. All locally produced articles are available. Wire service stories about the University of Texas and those about developments in Texas politics and government are also available. There are about 40 articles added weekly with coverage from September 1984 to the present.
The Dallas Morning News	Features complete coverage of Dallas, of Texas, and of the Southwest. The paper emphasizes business, political coverage, major story projects, sports, and life-style features on a national scope. It also features exclusive coverage of the 1984 Republican convention held in Dallas. The full text of all articles in the Home Final edition is available from January 1986 to the present. From August 1984 to December 1985, selected articles are available. Entire coverage is from August 1984 to the present.
Houston Chronicle	Covers space, energy, shipping, and oil and gas industries, as well as international finance, medical research, and technology. The full text of all articles with the exception of a few syndicated columns is included. More than one version of a story is kept if that story varies with a new edition. Coverage is from January to February 1985 partial—some gaps; March 1985 complete, with about 200 articles added daily.
San Antonio Light	Covers one of America's most unique cities. The full text of all articles is included, with coverage available since September 1989.

Washington

The Seattle Times	The leading paper in the Pacific Northwest. The paper recognizes the growing importance and economic impact of the Pacific Rim countries and the future of the Pacific Northwest. All articles are saved, except those of an ephemeral nature. Multiple versions of a story are kept when the versions vary substantially. About 170 stories are added daily, with coverage from January 1985 to the present.

Wisconsin

The Daily Reporter	Contains bidding notices, Circuit Court notices, bankruptcies, and the city of Milwaukee official notices, as well as other legal notices. Coverage dates include September 26, 1988 to the present with selected earlier data available. About 13 to 20 articles and over 100 legal notices and news stories are added daily.

Asia

The Free China Journal	A leading English-language newspaper distributed worldwide from The Republic of China. Coverage includes major domestic and international news and events, business news and developments, trade information, economic news, government and environmental issues, Mainland China, and editorial comment. It includes the full text of all articles, with coverage from October 1989 available.

Australia

Courier Mail/Telegraph Sunday Mail	Also known as the *Queensland Newspaper Information Service*, includes in-depth coverage of the booming Gold Coast, the struggling "Sugar Coast" and Granite Belt, and the emerging "Silicon Valley" of Australia. Resource coverage includes industry, tourism, high technology, government, and commerce in general, making the Australian Newspaper Network a valuable research tool in the United States. Coverage is from July 1984 to the present, with approximately 200 stories added daily. The articles are available within 24 hours of publication.

Canada

Business Information Wire	Provides coverage of corporate takeovers, economic trends, shifts in government policies, and key speeches by business leaders. It includes the full text of original stories and stories from affiliated wires distributed to subscribers of the Business Information Wire. It is updated daily with previous day's wire and covers from April 4, 1988 to the present.
Calgary Herald	Offers an outstanding daily business section, with a long list of national and international awards to its credit. Special attention is given to oil and gas news, with two staff writers covering this industry full-time. The coverage is from December 7, 1988 to the present including the full text of the *Herald* with the exception of advertisements, career ads, appointments, and data in tabular form.
Canada News-Wire	Contains the full text of both English- and French-language press releases carried by *Canada News-Wire*. The database contains press releases, financial reports, and disclosure material. The material covered is from March 1, 1988 to the present.
Canadian Press Newswire—Archival	Provides coverage of social, political, economic, and cultural news events from bureaus across Canada, The United States, and the United Kingdom. The coverage is from January 1, 1988 to the present.
Canadian Stock Quotations	Provides current and historical stock information from the Toronto, Vancouver, Montreal, and Alberta Stock Exchanges. The Quotations are updated continuously, with a minimum of a 15-minute delay. The coverage is from January 1, 1986 to the present.
The Edmonton Journal	Covers issues affecting Alberta, The West, and The North. It provides political, business, and general coverage from Alberta's capital. The full text of *The Journal* with the exception of advertisements, career ads, and data in tabular form is included.
Financial Times of Canada	A paper with a strong editorial commitment to research and the incisive analysis and interpretation of the facts and figures that make up the news. The full text of the articles including special Insider Reports and monthly "Personal Finance" supplements is included. Advertisements, appointment notices, stock listings, and data in tabular form are not included. The coverage is from January 7, 1985 to the present.
The Gazette	Provides current information on national and international issues, as well as the political, business, sports, entertainment, and fashion scenes in Montreal and throughout the province. The full text of articles with the exception of advertisements and data in tabular form is included in this database.
ICC Canadian Corporations Database	Provides information on the following types of companies: major Canadian public corporations trading on Canadian exchanges; major privately held federally registered companies (with revenue of over $10 million or assets of over $5 million); all Canadian companies listed on the Toronto Stock Exchange; all firms in the Report on Business 1000 list; and major federal and provincial crown corporations.
Maclean's	Brings to its readers a distinctly Canadian view of the world. It contains the full text of all of the articles.

The Ottawa Citizen	The only English-language daily in the nation's capital, with special features that include the Weekend Observer, an incisive review and analysis of national and international news, as well as the recently enlarged Business Section. Coverage is from September 3, 1985 to the present, with daily updates.
Public Sector	Provides news and analysis of government activities from coast to coast. It also explores the full meaning of federal and provincial policy proposals and tracks their progress as they evolve into legislation. Coverage is from January 11, 1988 to the present, including the full content of *The Public Sector* with Special Reports, Ottawa Preview, Ottawa Week, Appointments, Calendar & Publications, and the Legislative Summary.
Southam News	A wire service containing articles submitted by the 15 Southam newspapers and Southam correspondents worldwide. Coverage is from November 3, 1986 to the present. The wire appears six days a week with updates to the database at noon of the day after appearance.
The Toronto Star	Canada's leading and largest metropolitan daily newspaper, published seven days a week. Subjects covered include finance, local, and national news. Stories include the full text of the articles with the exception of advertisements and data in tabular form.
United States-Canada Free Trade Agreement	This database is divided into eight parts and each part is divided into chapters, then further into subchapters. It covers the General Agreement on Tariffs and Trade between the United States and Canada.
The Vancouver Province	Covers the local scene, the first sports results, and the business section. Coverage is from March 20, 1989 to the present, with world briefs being excluded. Appointment notices, birth and death notices, and legal advertisements are included. The editorial cartoon and graphic and tabular material are included.
The Vancouver Sun	Provides a new and important regional perspective to the service. It covers the Pacific Rim, international trade issues, and the forestry industry. The full text of articles, excluding advertisements and data in tabular form, is included. The database is updated 72 hours after publication, with coverage from January 2, 1987 to the present.
The Windsor Star	Material covered from October 20, 1986 to the present includes the automotive industry, labor, and agricultural aspects in the province of Ontario. It is updated daily, with Saturday's and Sunday's content available on Monday. The full text of articles, excluding advertisements and data in tabular form, is included.

Europe, Asia and the Middle East

Asahi News Service	Covers events in Japan and the Far East, with particular emphasis on Japanese policy and international relations, trade, telecommunications, computers, electronics, pharmaceuticals, medicine, and agriculture.
The Associated Press	Provides authoritative raw material for press, radio, and television reports in many parts of the world. The file includes American news, coverage from the United Nations and U.S. Congress, reports and texts of major speeches, details of agreements and treaties, biographies, and coverage of international relations, world finance, and science and technology. The coverage is from September 9, 1983 to the present and includes the full text of the Associated Press output for Europe.
The Banker	Reports on news and developments in international banking. Includes international trends and directions in banking, the securities industry and the regulatory environment worldwide, reports on international financial centers, and updates on industry concerns, news, personalities, and technological developments. Approximately 75 to 100 stories are added monthly, with the current month's articles available on-line within the first two weeks of the month.

BBC Summary of World Broadcasts	Contains material on major political and economic developments, government policies, international relations, fiscal and budgetary developments, and important personalities, as well as information on agriculture, communications, energy, manufacturing, minerals, trade, and transport. The articles are available on-line 48 hours after publication. Coverage is from January 1, 1982 to the present.
Campaign	Includes information about the advertising industry ranging from news and features to regular in-depth surveys of industry issues and disciplines. The contents include the full text of all articles. Approximately 100 items are added weekly with coverage from September 13, 1985 to the present.
The Daily and Sunday Telegraph	Provides business news relating to both the U.K. and international business events and issues. Articles are available 72 hours after publication. Coverage includes January 1987 to the present, with about 120 items added daily.
Deloitte Haskins EC 1992	A series of reports giving a briefing on the changing nature of European Community legislation, procedures, and policies. The file is updated weekly to include the latest legislation developments. New reports may be added to the file as EC policy evolves and new subjects need to be covered.
The Economist	Provides an analysis of politics, economics, business, finance, science, and technology. It contains the full text of all articles with the exception of letters to the editor. Coverage ranges from December 26, 1981 to the present, with about 80 items added daily.
EC Single Market Information-CELEX	Includes the text of the European Community legislation relevant to the *SPEARHEAD Single Market* database. This file is an extract of the full-text legislation from the *EC CELEX* database. It is updated monthly.
EC Single Market Information-SPEARHEAD	Covers the current and prospective European Community measures which will mean change for business between now and 1992. It is updated monthly and contains reports of European Community measures which are supported by the full text of the relevant legislation of the CELEX file.
Euromonitor Market Direction	A database of original international market research on a wide range of consumer markets. The file contains the full text of each country report for each of the 58 titles.
Financial Times	Covers everything of interest to the international business community. It also provides coverage of management, marketing, industrial relations, economics and politics, trade and industry, technology, and the arts. The coverage is from February 28, 1985 to the present, with about 200 articles added daily.
Financial Times Business Reports: Business/Finance	Covers international trade finance, insurance, and banking and provides analysis of markets in the Middle East, Latin America, and Eastern Europe, together with details of business opportunities in certain markets. The file dates back to September 1986, with the exception of the Euromarket Report, which dates back to September 1987, and World Commodity Report which dates back to January 1988.
Financial Times Business Reports: Energy	Provides information on the energy industry and its suppliers and financiers. There are about 7,500 new items added each year, with a weekly update.
Financial Times Business Reports: Media	Covers cable, terrestrial and satellite broadcasting, programming, VCRs, video and compact disks, videotex, teletext, and electronic publishing. The coverage includes January 1986 to the present with about 9,000 new items added each year.
Financial Times Business Reports: Technology	Based on the newsletter series, it covers the business aspects of new technology, and its scope is international. The file contains the full text of seven FinTech newsletters, with coverage ranging from January 1986 to the present.
Financial Times Mergers and Acquisitions	A monthly magazine published by Financial Times Business Information. There are over 600 items added monthly to this database, with coverage from December 1988 to the present.

The Guardian	Provides coverage of social issues, as well as politics and economics in the U.K. and internationally. It includes the full text of each issue with the exception of the Arts, Sports, Food & Drink, Travel, and Letters sections. It covers from July 14, 1984 to the present and includes about 100 articles added daily.
Hermes	Contains press releases from most of the major Government Departments as well as contributions from smaller departments and other bodies such as the Metropolitan Police, the Office of Telecommunications, and the Commonwealth Secretariat. Coverage is from June 1989 to the present.
Hermes Daily	A newsletter file which lists all of the press releases from various British Government Offices and Departments from the previous working day. The full text of the previous day's releases is included.
Hoppenstedt German Company Information	A directory of key information on over 46,000 leading German companies. The file includes details of companies that have a turnover in excess of DM 2 Million or that has more than 20 employees.
ICC Full Company Reports and Accounts	Provides the full text of published Annual Reports and Accounts of public companies. The full text and statistical data of Annual Reports and Accounts published by leading companies listed on the London Stock Exchange are included.
ICC Key Note Market Research	Contains over 200 market research reports published under the same name. The reports review individual consumer, business, and industrial markets mainly in the U.K., but there is also increasing coverage of Europe.
ICC Stockbroker Reports	Produced by brokers to advise clients on investment activity. The file contains the full text of reports from 29 contributing brokers. Coverage is from 1987 to the present.
The Independent	A U.K. daily newspaper providing coverage of local and foreign news, business, finance, the arts, health, education, sports, and the media. The full text of articles with the exception of tables, exchange rates, weather forecasts, births, deaths, marriages, sports, and entertainment listings, and the Saturday Magazine is included.
Jordan's Company Reports	Provide company profiles including corporate and accounting details for major U.K. limited companies.
Keesing's Record of World Events	Reviews the world's press and information services and draws information from sources such as embassies, political parties, and international organizations to produce comprehensive, impartial reports on all major economic and political events throughout the world.
Marketing	Provides detailed weekly coverage of product and market news. It provides news of product development and launches, case studies of marketing techniques and strategies, and marketing issue reports. It includes the full text of each weekly issue.
Marketing Surveys Index	Contains details of published research reports, including the title of each report, a brief summary of its contents, a keyword index to the markets and products covered, and bibliographic details of the report.
MSI Market Reports	Consists of a variety of marketing reports, each analyzing a single market and industry. The coverage is from February 1987 to the present.
McCarthy Online: Company Fact Sheets	Provides essential details of about 1,000 major companies. The file covers the top 900 U.K. companies and 100 foreign companies quoted on the London Stock Exchange. Each item is updated as the latest annual report and accounts for that company becoming available.
McCarthy Online: Company and Industry Press Cuttings Service	Provides access to worldwide company, industry, and market information from over 60 newspapers and business magazines. Coverage is from October 1, 1985 to the present.
Meal Quarterly Digest	Monitors advertising for 15,000 different brands, classified into 365 product groups with 22 broad product categories. Coverage is from March 1985 to the present.
Media Week	Provides a focus on the commercial side of the media including both the buying and selling of advertising space/time and the media's sales to the consumer. The full text of each weekly issues is included.

Mintel Daily Digest	Provides a daily briefing on marketing-related news and features in the U.K. national press, international business journals, and key specialist trade journals. Coverage is from September 1, 1986 to the present.
National Development Plans	Contains information on the development plans of over 70 countries. The amount of detail available varies for each country, as does the structure of the plan.
New Scientist	Covers scientific and technological developments, with particular attention to their economic, social, and commercial implications, and looks at emerging sciences and new applications. The full text of each weekly issue is included.
PR Week	Includes analysis of issues such as techniques and industry image, plus coverage of recruitment training and career development.
Super Marketing	A trade newspaper for senior managers in the U.K. food-based retailing industry, which also covers non-food markets. It provides coverage of business and property news, new product launches, promotions and developments in retailing techniques, legislation, and marketing strategies.
TASS News Agency	Provides detailed political and economic analysis, with commentary on Soviet foreign relations, international affairs, home news, Soviet trade and industry, and the country's scientific and cultural achievements.
Tenders Electronic Daily	Is a database of information on invitations to tender for public contracts, issued by the Office for Official Publications of the European Communities. The file is updated daily, adding approximately 40 to 50 new tenders.
The Times and The Sunday Times	Cover U.K. and international news, business, finance, law, cultural affairs, travel, and sport. Articles are available three days after the publication.
TODAY	Provides a source of general news and social comment, complementing the "heavier" political, economic, and business information provided by the other U.K. newspapers available through PROFILE information.
World Bank International Business Opportunities Service	Provides details of all projects for which World Bank funding is being sought, from the point of identification of investment opportunities, to the approval of projects by the World Bank's Executive Board.

Dow Jones News/Retrieval

Barron's Business & Financial Weekly	Provides national business and financial information. The database includes the full text of all articles and any tables that appear with articles. Other tabular material is not included.
Business Dateline	Contains selected full-text articles from more than 150 regional business publications from the U.S. and Canada. It is updated weekly with articles available in Business Dateline approximately four to six weeks after publication.
The Business Library	Includes the full text of selected articles from **Consumer Markets Abroad**, **Financial World**, **Forbes**, **Fortune**, **Inc.**, **Money**, and the full text of American Demographics and PR Newswire.
Business Week	Provides coverage of every aspect of North American business. Included is the full text of all articles. Charts and tables will be included when they conform to computer screen format. Business Index and Investment Figures of the Week will appear regularly.
Dow Jones News	Contains summaries of selected articles from **The Wall Street Journal**, **Barron's** and **Dow Jones News Service** since July 1979.
McGraw-Hill Library	Included is the full text of all articles published in McGraw-Hill's industry-specific publications, 20 newsletters, and five magazines.
The Wall Street Journal	Covers national and international business, financial, and economic news. It also provides coverage of major political events and current issues.
Dow Jones News/Retrieval Summary of Databases	Contact DataTimes for further information.
Industry/Government Codes	Contact DataTimes for further information.

Pricing Information

Connect time charges are consistent for every database offered. Subscribers can choose from two options. First, the subscriber must pay an $85 onetime subscription fee to join the service and will receive Quick Reference Cards, Information Sources Guide, Quarterly Newsletter, Continual System Training, and Customer Service. Option A provides an access rate of $1.59/minute ($95/hour) with a monthly minimum of $95. Option B provides an access rate of $2.33/minute ($140/hour) with no monthly minimum but an account maintenance fee of $15/month. These rates apply to all databases unless otherwise noted by DataTimes. Other features include global searching, Dow Jones News/Retrieval, and international databases. Global searching is available for $2.85/minute, Dow Jones News/Retrieval is available for $2.85/minute, and the international databases cost $2.85/minute. (Note: *PROFILE* databases carry an additional line charge of $0.11 or $0.07 per line depending on the file.) The communication fees are charged separately at $0.17 per minute, while the international communication fees vary depending on country accessed.

Electronic Library Service

DataTimes provides database management and computerized library services for several newspaper publishers, including *The Dallas Morning News*, *The Daily Oklahoman*, *The San Francisco Chronicle*, *The Seattle Times*, *The Houston Chronicle*, and others. These newspapers store their back issues on superminicomputers connected to DataTimes' network system or directly on DataTimes' computer service systems in Oklahoma City. The databases are updated daily, either electronically or via magnetic tape. DataTimes provides design, programming, communications, database management, updating, and 24-hour support for these publishers. The database can be private or marketed as a part of DataTimes' product offerings at the discretion of the publisher.

Compact Optical Disk Library System

DataTimes offers a compact optical disk library system for storing newspaper data. The system uses Digital Equipment Corporation's compact disk (CD) readers and a compact, read-only optical disk (CD-ROM). CD technology reduces storage costs of newspaper data 5 to 10 times.

DataTimes' system enables publishers to develop easily accessible disks of information and distribute them and provide data to their reporters, librarians, and on-line customers.

A complete CD Reader system consists of the compact optical disk with 600 megabytes of storage capacity, a disk reader, a 32-bit computer system (or MS-DOS-based microcomputer), standard database software, and a video display terminal. The price of the system depends on the combination of hardware and software.

Future Plans

According to the vendor, DataTimes will regularly add newspaper databases and wire services to its existing product line. ■

Dialcom, Inc.

Dialcom, Inc., founded in 1970, is a unit of British Telecom. Dialcom is one of the world's leading suppliers of electronic messaging and value-added data services. These services include worldwide electronic messaging, information, and value-added application products.

Dialcom offers its subscribers access to several news and information services. These include *ABI/INFORM, AP Associated Press Videotex Service, BNA Online, Official Airline Guide (OAG)*, the OPEC and UPI newswire services, and gateways to Dow Jones News/Retrieval and BRS Information Technologies' BRS/Menus service.

Dialcom's services are available through U.S. and international public data networks.

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COMPANY INFORMATION

Dialcom, Inc.
6120 Executive Boulevard
Rockville, Maryland 20852
Telephone (301) 881-9020

Company Background

Dialcom, Inc. was founded in 1970 in Silver Spring, Maryland as a time-sharing company. British Telecom, one of the world's leading telecommunications companies, with annual revenues of more than $17 billion, acquired the company in May 1986. Today, Dialcom is a member of The Dialcom Group, a British Telecom unit also including Telecom Gold, Value-Added Business Services (including the Prestel videotex service), and the computer network services division (provider of technical support for the U.K. operation). Dialcom provides electronic messaging and value-added data services to more than 280,000 users worldwide.

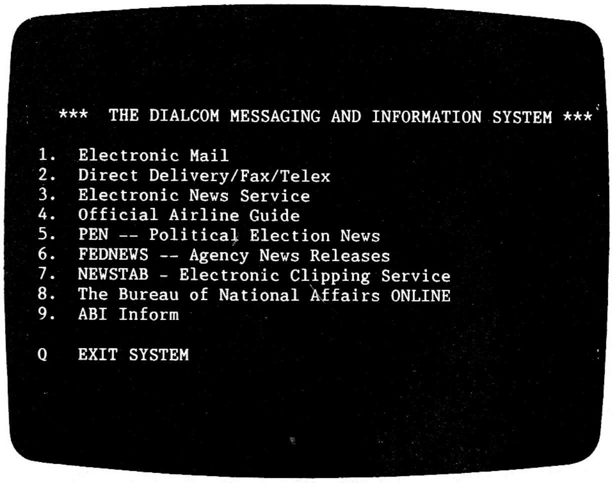
Shortly after its founding, Dialcom embarked on a vigorous acquisitions program. Within two years it had acquired the assets of several smaller time-sharing companies, greatly expanding its market base. In the mid-1970s, Dialcom began developing applications software for the office automation marketplace, anticipating a decrease in the demand for time-sharing services. During this time, the company also decided to make electronic mail the cornerstone of its product line. In 1975, Dialcom began developing its electronic mail system in earnest.

Today, Dialcom's primary service is electronic mail and value-added E-Mail applications, just as the company had envisioned in 1975. By any measure, Dialcom is a leading vendor of electronic mail services, both nationally and internationally. Nationally, its services are used by many *Fortune* 1000 companies, associations, and government agencies. Internationally, Dialcom's Global Mail Network links identical systems in the United Kingdom, Canada, West Germany, The Netherlands, Australia, Hong Kong, Singapore, Korea, and Denmark. Through Dialcom's XMAIL service, users have the option of sending electronic mail to any of the more than 200,000 public telex terminals in the U.S., and more than 1.8 million overseas. The Dialcom service also interfaces with TWX, Mailgram, and Cablegram.

In addition to its electronic mail service, Dialcom offers information retrieval services geared toward businesses and government.

Dialcom has embarked on a sweeping expansion program since its acquisition by British Telecom, the leading United Kingdom communications firm. It has consolidated its domestic and international operations in a new headquarters based in Rockville, Maryland and opened new branch offices in the U.S. and abroad. It addition, the company has introduced its X.400 message handling system, which permits easy and instant computerized message handling among dissimilar systems. Following the successful demonstration of this system at the CeBIT '87 telecommunications exhibition and at Telcom '87, Dialcom announced plans for its implementation on an international scale.

▷



```
 ***  THE DIALCOM MESSAGING AND INFORMATION SYSTEM ***

1.  Electronic Mail
2.  Direct Delivery/Fax/Telex
3.  Electronic News Service
4.  Official Airline Guide
5.  PEN -- Political Election News
6.  FEDNEWS -- Agency News Releases
7.  NEWSTAB - Electronic Clipping Service
8.  The Bureau of National Affairs ONLINE
9.  ABI Inform

Q   EXIT SYSTEM
```

Figure 1. Dialcom's main menu. Note the head "The Dialcom Messaging and Information System."

HANDS-ON EVALUATION

In 1975, Dialcom made a strategic decision to make electronic mail the hub of its product line. This was a bold move since E-Mail was then quite new. Today, electronic mail (termed "messaging," when more than basic communication is offered) remains Dialcom's hallmark, and the company has 280,000 users. The majority of these users are from *Fortune* 1000 companies and government agencies, with the latter accounting for 30 percent of Dialcom's revenues.

Dialcom's electronic messaging capabilities are among the most sophisticated available, and most people subscribe to gain access to these services. Elaborate message delivery services available to Dialcom subscribers as of September 1988, for example, include Facsimile and Direct Delivery. (The Facsimile service enables users to send text messages from their PCs or terminals to domestic and international fax telephone numbers. Dialcom's Direct Delivery messaging service enables users to send messages to auto answer printers or terminals that operate in an "unattended" mode.)

Dialcom's other strength, its news-related services (e.g., wire services), appeal primarily to public relations firms, advertising agencies, and others needing up-to-the-minute news.

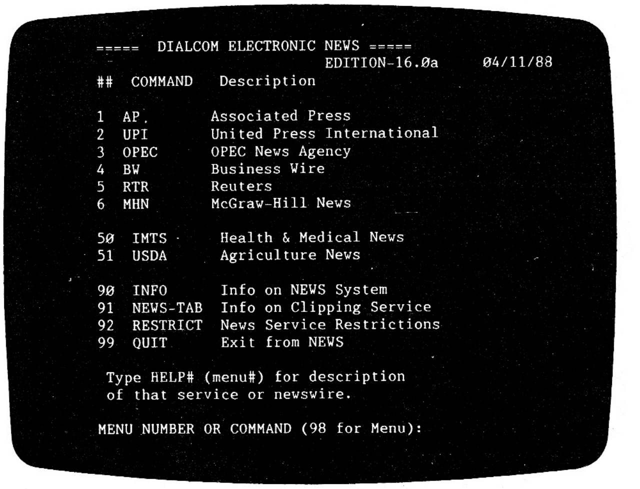
Users can access Dialcom through the Telenet or Tymnet networks. From the Washington, DC or New York City areas, access via a direct line is possible. We accessed the service through Tymnet. After calling up the local node, the user specifies Dialcom by typing in "Dialcom" and the number for the system number to which the user has been assigned (e.g., Dialcom; 44). The user then enters "ID" along with his or her chosen password. The system then responds with the system level prompt ">".

Typing in "menu," here brings up the menu of available services, shown in Figure 1. The heading reads "the DIALCOM Messaging and Information System." The first option from this main menu is electronic mail. Thus, the service's emphasis is clear from the outset.

Specifying electronic news services, an item off the main menu, brings up the impressive submenu shown in Figure 2. We were surprised to see the extent of the news offerings available through Dialcom. All the major wires are here: UPI (see Figure 3), AP, Reuters; also McGraw-Hill News, the OPEC News Agency, and Business Wire. Each news service is searchable, although users can search only one newswire at a time. The type of searching that's possible varies with the particular newswire. For instance, the top option from the UPI menu offers the selection URGENT stories. When that's selected (and who could resist?), a message appears that the computer is looking for urgent stories, and requests "patience please." Some newswires permit the use of Boolean Operators, others don't. Retrieved stories can be filed electronically in the user's mailbox or mailed to other DIALCOM users.

News and communications are Dialcom's obvious focus, but research-oriented files, including the popular business database, *ABI/Inform*, are here also. Dialcom's loading of the file permits some sophisticated searching, including the ability to expand terms. Extensive on-line help information is available, although admittedly this is not the most cost-effective way to learn what the file contains or how to search it. The point is, however, that Dialcom does not just throw you into the database without a compass.

Like many other on-line vendors, Dialcom now offers a special service for AIDS information. Called *AIDS Daily*



```
=====  DIALCOM ELECTRONIC NEWS =====
                         EDITION-16.0a     04/11/88
##  COMMAND   Description

1  AP        Associated Press
2  UPI       United Press International
3  OPEC      OPEC News Agency
4  BW        Business Wire
5  RTR       Reuters
6  MHN       McGraw-Hill News

50  IMTS      Health & Medical News
51  USDA      Agriculture News

90  INFO      Info on NEWS System
91  NEWS-TAB  Info on Clipping Service
92  RESTRICT  News Service Restrictions
99  QUIT      Exit from NEWS

 Type HELP# (menu#) for description
 of that service or newswire.

MENU NUMBER OR COMMAND (98 for Menu):
```

Figure 2. Dialcom offers an impressive array of electronic news services, as shown in this menu.

Competitive Position

One of the most successful companies in the electronic communications and information market, Dialcom has a strong U.S. and foreign subscriber base. Its competitors include CompuServe and MCI, two companies that in a sense are working together. CompuServe and MCI have interconnection agreements, whereby subscribers of one system can exchange messages with subscribers of the other. For its part, Dialcom has chosen not to take part in such arrangements. Chairman John Morris has been quoted as saying Dialcom shouldn't "offer access to others in an embryonic industry." He further noted that you have to be careful "not to shoot yourself in the foot" when interconnection agreements are made. (Dialcom, however, admits it discusses interconnection agreements with other companies.) Other Dialcom competitors include Western Union, which offers the EasyLine electronic messaging system.

HANDS-ON EVALUATION (Continued)

Summary, each day the service provides about 15 concise summaries of what's being said and published on AIDS. This information is delivered automatically to subscribers' mailboxes. Subjects include research efforts, treatment and prevention, and public policy. Dialcom donates a portion of the money it receives in subscription fees to this service to AIDS organizations.

A service with particular appeal to the media is Dialcom's Political Election News (PEN), produced by American Political Network, Inc., McLean, Virginia. We accessed PEN in October when the fall election was red hot. We found it incredibly complete, drawing on seemingly hundreds of sources nationwide. Among its offerings (see Figure 4) is an on-line news feature called *Campaign Hotline*, a daily briefing on election-related news.

Dialcom also offers gateways to Dow Jones News/Retrieval and BRS Information Technologies' (BRS') BRS/Menus service. We tried the gateway to BRS/Menus (Figure 5), which is the menu-driven version of BRS' on-line service. Accessing the service through the gateway took longer and was more expensive than it would have been if we had accessed it directly. Still, the gateway was seamless. Once connected (to transfer over the user merely types in BRS at the main prompt), BRS' commands apply.

One of Dialcom's best features, and a must for regular users, is the Newstab electronic clipping service. Newstab is set up similarly to NewNet's NewsFlash service. A user can instruct the system to monitor news wires for up to 25 search terms. If Dialcom receives articles containing these terms, they are automatically mailed to your electronic mailbox. Newstab scans all of Dialcom's wires services, delivering stories within minutes of their receipt.

Information may be power, but for Dialcom's users this power does not come easily. All new subscribers go through an extensive three-day training session, given at Dialcom's Rockville headquarters. "Power users" may think they can avoid this training, because at first glance the system seems intuitive and easily commandeered. For example, we tried to navigate Dialcom without documentation (it had not yet arrived). After logging in, we were momentarily baffled when a greater than sign (<), instead of a menu, greeted us. Remembering that electronic mail is a Dialcom mainstay, we chose to try entering that area by typing "mail." Sure enough, that's where the system deposited us.

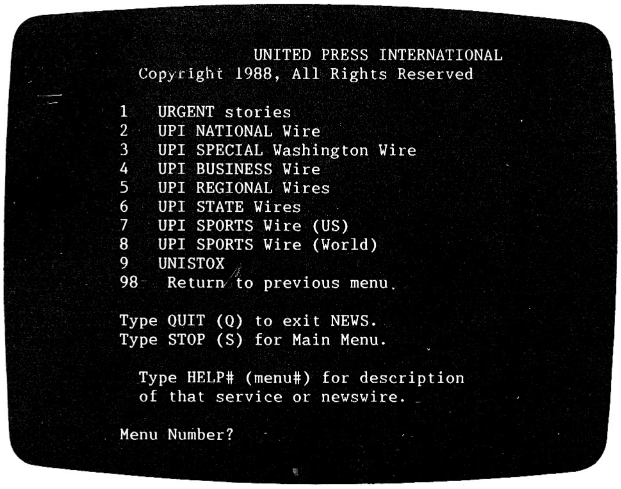
In addition to the three-day session, other training options include an on-line tutorial (dubbed Learn) for learning its electronic mail system. Learn users have two choices: to go through a basic tutorial or an intermediate E-Mail tutorial. Also, Dialcom documentation includes a series of quick reference cards and a complete manual in loose-leaf format.

Finally, Dialcom offers a toll-free Customer Support number. We called this number several times, and each

▷ Dialcom markets its services aggressively, particularly since its purchase by British Telecom. The company holds regular training sessions for operators, support people, and salespeople. Its current strategy is to move beyond its traditional markets toward "media companies." Its messaging service would have great appeal to reporters, for example, looking for fast ways to file stories. New services such as Direct Delivery, which allows reporters to send directly into internal composing systems (e.g., Atex) from anywhere, should help it penetrate this market.

Currently, an electronic mail user can only send messages to another E-Mail system user if that person's "mailbox" number is known. A recommended standard, X.500, would provide what's been called a "global directory capability." This information would provide details on each of the communication methods by which that person can be reached, including telephony, electronic mail, telex, ISDN, physical delivery (e.g., the postal system), and facsimile. Another consequence of X.500 would allow for storing and changing E-Mail distribution lists across E-Mail systems.

Obviously X.500 has the capability of increasing the use of electronic mail dramatically—not only for Dialcom but for its competitors as well. However, it's possible that the Bell Regional Holding Companies would get involved in this kind of "directory assistance," making the field even



```
                 UNITED PRESS INTERNATIONAL
   Copyright 1988, All Rights Reserved

     1   URGENT stories
     2   UPI NATIONAL Wire
     3   UPI SPECIAL Washington Wire
     4   UPI BUSINESS Wire
     5   UPI REGIONAL Wires
     6   UPI STATE Wires
     7   UPI SPORTS Wire (US)
     8   UPI SPORTS Wire (World)
     9   UNISTOX
     98   Return to previous menu.

     Type QUIT (Q) to exit NEWS.
     Type STOP (S) for Main Menu.

       Type HELP# (menu#) for description
       of that service or newswire.

     Menu Number?
```

Figure 3. Dialcom's UPI newswire offers readers the option of viewing "urgent" stories right off. It's actually possible for users to stay connected to the service and read stories as Dialcom receives them.

HANDS-ON EVALUATION (Continued)

time we got through after only two rings, which is something of a record for this industry. The quality of the support, however, although better than some other vendors', was below average overall. The reps did not instill confidence (the comfort factor) and fumbled around en route to answering our questions. On one occasion, we had to speak to three individuals before finding the one who could assist us.

Yet, more than any other on-line service we've tested, Dialcom makes you feel you are getting the news as quickly as the media reports it. When reading the wires, for example, after you've read the last story available, the system gives you the space-age (oops, information age) message: "You are awaiting stories not yet transmitted. Please wait or type STOP to reenter a new menu selection." This startled us. It was almost as though we were not only waiting for events to unfold but that we could somehow force the issue.

Dialcom, while basically a friendly and helpful service, can also be surprisingly stuffy. A section of the DIALCOM news services menu called "restrictions" read a little like the 10 commandments (e.g., you shall not publish information from the service in any medium; you shall not store any portion of the service).

Dialcom's service is built around communications, and whereas on other services (e.g., CompuServe) electronic communications is an extremely simple operation, on Dialcom there's quite a learning curve. To be fair, Dialcom offers much more than your standard read or send options. It claims in its literature "the most powerful, sophisticated electronic mail service available." This may well be true.

In relaying a minor criticism, we have an "amusing" story to impart. In setting up our Newstab profiles for current awareness, we made the mistake of choosing McGraw-Hill as a keyword for regular scanning. The next time we logged on (and this spanned a weekend), we were surprised to find more than 600 items in our mailbox! In reviewing the messages, we saw that the system had electronically forwarded *every* story filed by McGraw-Hill News. This occurred since the term McGraw-Hill was part of the header information each story included. For us, this was an annoyance. For others, though, it could have been expensive: Dialcom charges $0.40 for each McGraw-Hill News article it delivers to your mailbox.

This was bad enough, but we were further disappointed when a customer service rep said there was no way around this. Sensing this didn't seem right, we checked with another rep. Initially stymied, the rep called us back to say that entering "McGraw-Hill not copyright" as a search term would have eliminated those nuisance hits. (It's so simple when you know the answer.)

These annoyances are mere flotsam; Dialcom users can still look forward to basically smooth sailing. If current awareness information and electronic communications are priorities for you, Dialcom has much to offer.

more competitive. Rather than compete with these companies, Dialcom may find a way to work with them. It has already formed an alliance with NYNEX, for example.

RESOURCES AND FACILITIES

Processing Center

Dialcom recently moved into a newly constructed building in Rockville, Maryland. The new center has more than 12,000 square feet of floor space for computer equipment, with an additional 20 percent allocated for expansion. It includes two uninterruptible power sources to protect Dialcom's computers from power surges and dips.

Dialcom's fleet of more than 130 computers worldwide include Prime 750s, 850s, and 9955s.

Systems Software

Dialcom uses a customized version of the Primos operating system on its host computers. The applications software for specific products, such as electronic mail and electronic publishing, are written in Fortran and Fortran 77, although some new products are being developed in the PL/1 and C languages.

Customer Support Services

Dialcom's support organization strives to properly introduce users to office automation concepts and applications. Each installation is tailored to the specific needs of the client (for example, Dialcom will create customized menus). In addition, Dialcom will send members of its training and consulting teams to the user's site to introduce office systems and explain system applications. Training can be given in a classroom, in individual sessions, or to the client's own team of instructors.

Dialcom's client consultants also provide services in other areas, such as terminal selection, special software needs, communications, database management design, and any other computer-related office need.

Dialcom, Inc.

30-DAY PLAN

This schedule applies to access to general DIALCOM electronic messaging and value-added data services, such as:

- Electronic Mail
- XMAIL Telex/Mailgram gateways
- File Transfer
- PC Interfaces
- Text & Spelling Editor
- Electronic Forms
- Bulletin Boards
- Conferencing
- Calendar Scheduling
- Database Management
- Electronic Publishing

and a variety of national/international news and information services such as:

- AP, UPI, Reuters, McGraw-Hill
- Business Wire, PR NEWSWIRE
- Stock Reports
- OAG and Eaasy Sabre travel services
- Health and medical news
- Newswire Clipping
- Federal news services

This schedule does not include all Dialcom Services. However, use of any service not listed will result in applicable charges.

CONTRACT TERM[1]	30 DAYS	
MONTHLY USAGE MINIMUM[2]	First 6 months: After 6 months:	None $500.00
MONTHLY ACCOUNT FEE[3]		$100.00

HOURLY CONNECT & DISCOUNTS[4]	Prime ($)	N/Prime[5] ($)
Per Hour for First 75 hours	14.00	6.50
Per Hour for Next 75 hours	13.60	6.30
Per Hour for Amount over 150 hours	13.00	6.05

NOTES:

[1] All products and services pricing is subject to change upon 30 days' notice unless otherwise specified.

[2] All usage charges apply to the monthly minimum. For new clients, the monthly usage minimum does not go into effect until the beginning of the seventh full month of service.

[3] The monthly account fee is a monthly charge in addition to usage charges.

[4] The minimum connect session is one minute. Dialcom determines the hourly connect usage as follows: The start time is added to the elapsed session time to calculate the stop time. The hourly connect usage is computed in system clock minute increments, where the start time (rounded down to the nearest whole minute) is subtracted from the stop time (rounded down to the nearest whole minute), and one minute is added to compensate for rounding. The Dialcom reconnect feature, triggered by an abnormal disconnect, will maintain the user's connection for up to five minutes. The reconnect feature is charged at the applicable hourly connect, network communications, and premium product rates.

[5] PRIME Hours: Monday through Friday 8:00-5:59 EST
NON-PRIME Hours: All other hours, including weekends, January 1, July 4, December 25, and the following national holidays as observed: Martin Luther King Day, Presidents' Day, Memorial Day, Labor Day, and Thanksgiving Day.

MONTHLY STORAGE & DISCOUNTS[6]	($)
Per Block for First 2,500 blocks	0.50
Per Block for Next 2,500 blocks	0.45
Per Block for 5,001 blocks and above	0.40

KILOCHARACTER TRAFFIC[7] 0.05 per Kilocharacter

HOURLY NETWORK COMMUNICATIONS (300-2400 Baud)[5,8]

	Continental USA Per Hour		Hawaii Per Hour		Alaska Per Hour	
Network Service	Prime ($)	N/Prime ($)	Prime ($)	N/Prime ($)	Prime ($)	N/Prime ($)
Telenet	5.00	4.00	20.00	20.00	16.00	16.00
Tymnet	7.00	6.00	23.00	6.50	19.00	9.50
Public 800 WATS	17.00	17.00	17.00	17.00	17.00	17.00
Dialcom Network	7.00	6.00				
DC Metro LATA	5.00	4.00				
ConnNET	5.00	4.00				
Private Network[9]	1.00	1.00				

International Travelers Network: Rates available on-line for International access to Dialcom USA Services via TELENET, TYMUSA, and CSC Infonet public data networks. (>INFO ITN)

[6] Monthly storage charges are based on the monthly average of storage blocks that reside on the system at the end of each day. One block is equal to 2,048 characters, where each fraction of a block is charged as a full block. The minimum unit per user ID is one block. The minimum unit per filed electronic mail message is also one block. Applications with utilities for search and retrieval, shared directories, or group parameter initialization will incur additional storage units to support the application file structures. These include Calendar, Caucus, Epub, Forms, INFOX, Electronic Mail, Bulletin Boards, and Menu Controllers.

At no additional charge, Dialcom allows 15 days for reading unread, unfiled messages and 5 days for deleting unfiled messages once they have been read. After the grace period, the messages are automatically stored in the user's mail files (*UNREAD and *READ categories) and are subject to the applicable monthly storage charges.

[7] Dialcom determines Kilocharacter Traffic charges on a per-session basis. One kilocharacter is equal to 1,000 characters (or fraction thereof) transmitted in and out of the system. The minimum unit is one kilocharacter.

[8] Dialcom measures Network Communications usage in the same way it measures Hourly Connect usage. The minimum communications unit for public networks is three minutes. The minimum unit for the Dialcom Network and private networks is one minute. Charges for certain other networks not listed above may appear on monthly invoices as PNET usage and are charged at Tymnet rates.

Continental U.S. does not include Alaska and Hawaii, which are priced separately.

[9] Charges for installation of private networks will be quoted separately.

Table 1. Dialcom's most current price schedule.

Sales and Marketing Services

Dialcom maintains marketing branches in New York, New York; Cambridge, Massachusetts; Washington, DC; San Francisco, California; Des Plaines, Illinois; Dallas, Texas; Orlando, Florida; and London, England. Its messaging products are offered worldwide through 16 international licensees.

System Security

Dialcom's computer system is protected by a variety of security features, including hardware, software, and physical protection measures. These precautions protect both the overall integrity of the system and the individual user's access to the system. In addition, Dialcom has developed proprietary features that enhance its security.

Some of the major nonproprietary features of Dialcom's system include:

- Automatic line disconnect, to prevent random access
- Access virtual control panel via software only, to prevent physical access to the Prime hardware
- Key software maintained separately from user access
- Encryption of all password information
- Time and day of last login display for each new login, to alert users of possible illegal access
- User capability to change personal password as frequently as desired

PREMIUM PRODUCTS & SERVICES[10]

VALUE-ADDED MESSAGING & INTERCONNECT[11]

XMAIL User Registration	$5.00 per User
INTERNATIONAL Dialcom Electronic Mail[12]	0.50 per Message Unit
TELEX/MAILGRAM/CABLEGRAM Gateway	Rates available on-line
Volume Discounts for Monthly Telex/Mailgram/Cablegram premiums between $ 1,000-$ 5,000	10% on this portion
5,000- 15,000	15% on this portion
15,001 and above	20% on this portion

	Message Unit (1st) ($)	(Additional) ($)
DIRECT DELIVERY Electronic Mail		
Continental U.S.	0.40	0.15 per Recipient
FAX DELIVERY		
Continental U.S.	0.55	0.35 per Recipient
Hawaii, Alaska & International	Rates vary by destination; available on-line	

SPECIAL APPLICATIONS

	Prime ($)	N/Prime[5] ($)
Bulletin Boards & Conferencing		
• CAUCUS Electronic Conferencing	6.00	6.00 per Hour
• TRADEPOST Bulletin Boards	0.15	0.15 per Item Posted
EPUB Electronic Publishing	6.00	5.00 per Hour
EPUB Clipping: Per Search Term/	0.75	0.75 per Update
Category	0.25	0.25 per Story Mailed
File Transfer Services[13]		
FT ASCII/Binary File Transfer	2.00	2.00 per Hour
KERMIT ASCII/Binary File Transfer	No premium	No premium
XMIT ASCII X-on/X-off File Transfer	2.00	2.00 per Hour
WP/PCMAIL Batch Message & File Transfer	2.00	2.00 per Hour
INFOX Database Management System	6.00 +0.10	5.00 per Hour +0.05 per CPU Second
NETLINK Gateway Link Services[14]		
To systems in Continental U.S.		
Network call prepaid at destination	2.00	2.00 per Hour
Network call payable by caller (Dialcom)	8.00	8.00 per Hour
To systems at other locations	25.00	25.00 per Hour
Electronic Forms Services		
• REQUEST Forms	No premium	No premium
• PERFORM Forms Processing & Management	0.05 per Kilocharacter unit	

PREMIUM PRODUCTS & SERVICES[10]

INFORMATION SERVICES

	Prime ($)	N/Prime[5] ($)
Newswires & News Services		
ASSOCIATED PRESS Videotex Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25
BUSINESS WIRE News Service	30.00	30.00
Per NEWS-TAB Story Mailed	0.30	0.30
McGRAW-HILL News Service	45.00	36.00
Per NEWS-TAB Story Mailed	0.40	0.40
OPEC News Agency Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25
PEN Political Election News Services	65.00	65.00
Per EPUB Story Mailed	0.30	0.30
Per Search term per Day	1.00	1.00
PR NEWSWIRE News Story	30.00	30.00
Per NEWS-TAB Story Mailed	0.30	0.30
REUTERS News Service	45.00	40.00
Per NEWS-TAB Story Mailed	0.40	0.40
UPI News Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25
UPI's UNISTOX Stock Reports	18.00	15.00
DOW JONES NEWS/RETRIEVAL Service[15]	Rates available on-line (>INFO DOWJONES)	
NEWS-TAB Electronic Clipping Services		
Per Search term per Day	1.00	1.00
Per Story Mailed	See separate newswires	

	Prime ($)	N/Prime ($)
Government News & Information Services		
FAR (Federal Acquisition Regulations) Online	32.00	32.00
FEDNEWS Government Agency News Service	18.00	15.00
FEDWIRE (White House, State Dept and DOD News)	20.00	20.00
CBD Search Service:		
Plan 1 (100 search terms, 2 report formats)	160.00 per MONTH	
Plan 2 (300 search terms, 4 report formats)	300.00 per MONTH	
Plan 3 (500 search terms, 10 report formats)	600.00 per MONTH	

	Prime ($)	N/Prime ($)
Health News Services		
IMTS Health & Medical News	18.00	15.00
AIDS Daily Summary Service, per Mailbox	45.00 per MONTH	

	Prime ($)	N/Prime ($)
Business Information Services		
ABI/INFORM Business & Management Journal Abstracts	75.00	75.00
Bureau of National Affairs BNA Online	85.00	85.00
Per Tax Update Story Mailed	6.00	6.00
BRS/Search Service	Rates available online (>INFO BRS RATES)	

Table 1. Dialcom's most current price schedule. (Continued)

- Console log of all illegal login attempts, monitored periodically to detect a personal computer attempting random passwords

- Access to electronic mail is restricted to the message recipient; not even a member of the Dialcom staff can access a user's mailbox

- Private message confidentiality option through use of a message-specific password

- Password length flexibility (up to 30 characters)

- Password expiration every 60 days

PROCESSING SERVICES

Pricing

Dialcom offers a variety of pricing plans. Corporate users can subscribe under a 30-day plan (see Table 1) or under a plan that requires a 1-year commitment. There is also a pricing schedule for individual users. Contact Dialcom directly for additional information.

APPLICATION-SPECIFIC SERVICES

Dialcom considers electronic mail to be the hub of its value-added messaging and information services. Its electronic mail system is integrated with other international and domestic communications services, including Telex

	Prime ($)	N/Prime ($)
Travel Services		
EAASY SABRE Travel Service (Network charge only)	8.00	8.00
OAG Electronic Edition[16]		
Per Minute	+0.25	+0.20
Per Page of Schedules, Hotels, Motels	+0.35	+0.25
Per Page of Fares, Rules	+0.50	+0.35

NOTES:

[10] Premiums are in addition to Hourly Connect, Kilocharacter Traffic, and Network Communications. Unless otherwise specified, premiums are based on an hourly rate and the minimum session is four seconds.

[11] Dialcom applies a charge for multimedia messaging services, such as telex, mailgram, fax, and direct delivery, and originates them from the continental U.S. The charges and message rate minimums are based on International Record Carrier rates and are subject to change at any time. Type INFO RATES for telex and other multimedia message rates. The MESSAGE UNIT is 1,000 characters or portion thereof.

[12] The rate for electronic mail messages sent to internationally located Dialcom licensee systems is applied per message per licensee system destination. Acknowledgments of receipt from international addresses are charged at $0.50 per acknowledgment requested per international mailbox. The MESSAGE UNIT is 1,000 characters or portion thereof.

[13] Use of the file transfer packages results in additional character transmission overhead for error checking and retransmission of text when errors are detected. The processing may result in less than maximum transmission speeds.

[14] When domestic NETLINK is used to gateway to non-Dialcom systems located in the continental U.S., a premium of $2.00 per hour applies. If, however, the gateway results in a caller-payable (i.e., Dialcom) network call, an additional $6.00 per hour is charged to cover the communications cost.

[15] The minimum connect session for Dow Jones News/Retrieval is one minute. For premium charges, Prime and Non-Prime time are as follows:

PRIME Hours:	Monday through Friday 6:00 a.m.-8:59 p.m. EST
NON-PRIME Hours:	All other hours, plus weekends and holidays of New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

[16] The minimum connection session for OAG is one minute.

> Unless otherwise agreed, Service is subject to the Terms and Conditions of the Dialcom Service Agreement. Customer is responsible for the use, application, and results obtained from Services selected. All on-line displays of usage statistics are approximations and are supplied for customer's convenience. Unless otherwise noted, all charges per measure of product/ service are for the stated measure or fraction thereof.

SUPPORT & RELATED SERVICES

PC SOFTWARE

	Qty.	Per Copy ($)
UPFRONT PC Communications Package IBM compatible interface to on-line products such as MAIL, XMAIL and information services. Package includes program program diskettes, utilities diskette, and a User Guide.	1- 25	139.00
	26- 100	128.00
	101- 500	118.00
	501-1,000	115.00
	1,001-5,000	101.00
	5,001+	90.00

	1st Copy	Add'l. Copies
DIALCOM*101 PC-Based Tutorial	10.00	5.00

USER DOCUMENTATION

	Per Copy Qty. 1-99 ($)	Per Copy Qty. 100+ ($)
DIALCOM SERVICES User Guides		
Full Package	23.00	20.00
Electronic Mail User Guide	10.00	8.00
Xmail User Guide	4.00	3.00
File Transfer User Guide	6.00	5.00
Tradepost User Guide	3.00	2.50
Forms User Guide	3.00	2.50
News & News-Tab User Guide	3.00	2.50
Caucus User Guide	3.00	2.50
EPUB User Guide	3.00	2.50

	Qty. 1-99 ($)	Qty. 100+ ($)
DIALCOM QUICK REFERENCE Guides/Cards		
Messaging Services	3.00	2.50
News & Information Services	2.50	2.00

	Qty. 1-99 ($)	Qty. 100+ ($)
DIALCOM TRAINING Guides	2.50	2.00

	Per Copy ($)
DIALCOM System Manager Guides	
Dialcom System Manager	15.00
Calendar System Manager	5.00
Directions System Manager	10.00
EPUB System Manager	20.00
FORMS System Manager	20.00
TRADEPOST System Manager	15.00
NUSAGE	10.00
DOW JONES NEWS/RETRIEVAL	10.50
DIALCOM TODAY Newsletter (Quarterly)	Free

- Other user guides are available for products as they are offered. Prices are published on-line. (>INFO MANUALS RATES)
- Quantity discounts for User Documentation are determined on a per-order basis, and not cumulative orders.

SUPPORT & RELATED SERVICES

	Per Hour ($)
CUSTOMER SUPPORT SERVICES	
Account Training	50.00
Teach the Teacher	50.00
System Manager Services	50.00
Custom EPUB Installation	50.00

	Per Day ($)
CUSTOM PROGRAMMING SERVICES Plus Travel and Reimbursables	600.00

	Per Month ($)
SPECIAL BILLING REPORTS	
Hard Copy Detailed Billing Report	50.00

Table 1. Dialcom's most current price schedule. (Continued)

I/Telex II, Cablegrams, and Telegrams. Additional communications systems include bulletin boards (both public and private), teleconferencing, and interterminal "chatting."

Electronic Mail

Dialcom, one of the earliest entrants in the electronic mail market, developed its system in the mid-1970s. Like any electronic mail system, Dialcom's uses a computer to pro-

	Per Month On-Line ($)	Per Month via Tape ($)
Contract Summary	50.00	200.00
Division Summary Report	50.00	200.00
Department Summary Report	50.00	200.00
User ID Summary Report	50.00	200.00
Usage Summary Reports	100.00	300.00
ALL Summary Reports	250.00	500.00
Electronic Mail Statistical Reports	250.00	500.00
Billing Transactions (INFOX or EBCDIC)	250.00	500.00

MAGNETIC TAPES	
Purchase	30.00 per Reel
Storage	20.00 per Reel
Access	10.00 per Access
HIGH-SPEED PRINTING	0.20 per Page
DELIVERY & HANDLING	
Via UPS, USPS, Air freight, Courier	Cost + 20%
Via Dialcom Courier, Local DC area	20.00 per Pick-up or Delivery

Table 1. *Dialcom's most current price schedule. (Continued)*

▷ cess person-to-person communications, permitting instantaneous, around-the-clock transmissions of most forms of office communications. Users access system functions via plain-English commands. Conversations and reading, filing, retrieval, posting, and updating of intra- or interfacility messages can be transmitted. A HELP command provides tutorial guides when requested. Automated distribution lists and text editing capabilities also enhance message transmissions.

As previously mentioned, Dialcom has integrated its electronic mail service with other communications services. These services include:

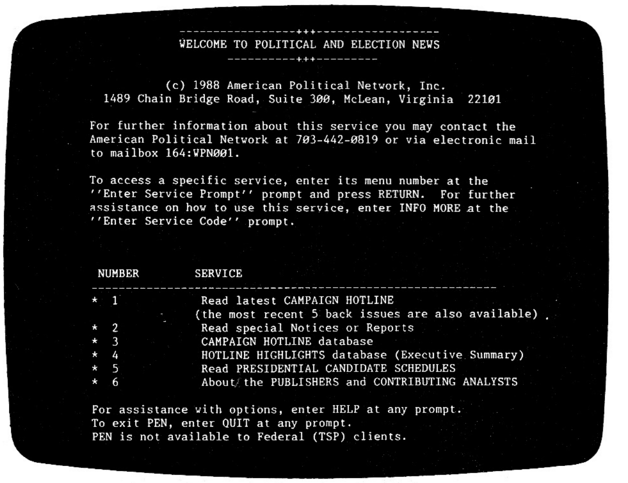
- *WPMAIL*—a special program that allows noncompatible word processors to "talk" to one another. As such, it transmits "clear" text from, for example, a Lanier diskette to a Wang. Additionally, if the communicating word processors are "like" terminals using identical codes for tabs, underlining, etc., this information can also be exchanged.
- *PCMAIL*—a PC-based mail transfer system that enables users to send mail messages created off-line on a PC through the Dialcom mail service to other users.
- *Telex Interface*—can be used to add over a million delivery locations around the world for Telex Messages, Mailgrams, Cablegrams, and Telegrams.
- *Automated Information Delivery Service*—an automated service for transmitting information to unattended terminals or computer systems. This service is designed to alert users to critical and time-sensitive information. A customized version for the press and media is available, which will deliver directly to an Atex or SII publishing system. Unlike "traditional" electronic mail, direct delivery messages do not require the receiver to do anything in order to receive the message.
- *Electronic Mail Facsimile Service*—allows users to send facsimile messages, both domestic and international, directly from their personal computers. Via this capability, users may send a single message to an unlimited number of recipients.
- *PathFinder Message Handling Services*—a message handling system that allows two-way communication of electronic messages between a variety of electronic mail systems. The network-independent service is designed to connect the widest range of communications with the widest global reach. PathFinder is part of Dialcom's new X.400 message handling service.

Electronic Bulletin Board

Subscribers can post announcements, policy and guidance statements, job openings, and other information. Users may respond directly to the individual or post the response on their system.

Electronic Publishing

With Dialcom's EPUB software, users can create their own electronic publishing center to publish newsletters, press releases, technical or financial reports, and product or service bulletins. The system can permit or restrict information accessibility on a person-by-person basis. In addition, the system is custom-tailored to provide easy-to-use menus with options for scanning headlines or titles, reading items in their entirety, or full-text searching. Another feature permits users to create a personal file of search terms. When data is loaded into the system and it matches the profile, the system automatically mails the items to the user's electronic mailbox.



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                  -----------------+++------------------
                  WELCOME TO POLITICAL AND ELECTION NEWS
                           ----------+++---------

              (c) 1988 American Political Network, Inc.
     1489 Chain Bridge Road, Suite 300, McLean, Virginia  22101

  For further information about this service you may contact the
  American Political Network at 703-442-0819 or via electronic mail
  to mailbox 164:WPN001.

  To access a specific service, enter its menu number at the
  ''Enter Service Prompt'' prompt and press RETURN.  For further
  assistance on how to use this service, enter INFO MORE at the
  ''Enter Service Code'' prompt.


   NUMBER         SERVICE
  -----------------------------------------------------------
  *  1             Read latest CAMPAIGN HOTLINE
                  (the most recent 5 back issues are also available).
  *  2             Read special Notices or Reports
  *  3             CAMPAIGN HOTLINE database
  *  4             HOTLINE HIGHLIGHTS database (Executive Summary)
  *  5             Read PRESIDENTIAL CANDIDATE SCHEDULES
  *  6             About the PUBLISHERS and CONTRIBUTING ANALYSTS

  For assistance with options, enter HELP at any prompt.
  To exit PEN, enter QUIT at any prompt.
  PEN is not available to Federal (TSP) clients.
```

Figure 4. Dialcom's Political and Election News (PEN) service offers authoritative, well-researched information from the political front.

File Transfer Services

FT—a file transfer service that allows users to transfer both single and batch files between PCs and the Dialcom on-line system. The service interfaces with the Dialcom mail service and it works with the selected communications package. FT provides error detection and correction for the transfer session.

FT is compatible with popular communications packages. Currently, FT supports the xmodem, ymodem, and Kermit protocols.

XMIT—a file transfer service that allows users to transfer ASCII text files between a PC or word processor and the Dialcom on-line system.

Executive Calendar System

Dialcom's calendar system enables users to scan the schedules of up to 15 people at once; display open time slots; check the availability of the conference room or slide projector; and place a meeting in all schedules—all with a single entry.

Scheduled items can be tagged as Accepted, Tentatively Accepted, Pending, Declined, Canceled, or Just a Reminder. Changes in status, date, time, or appointment details, such as room changes or attendee lists, can be made easily.

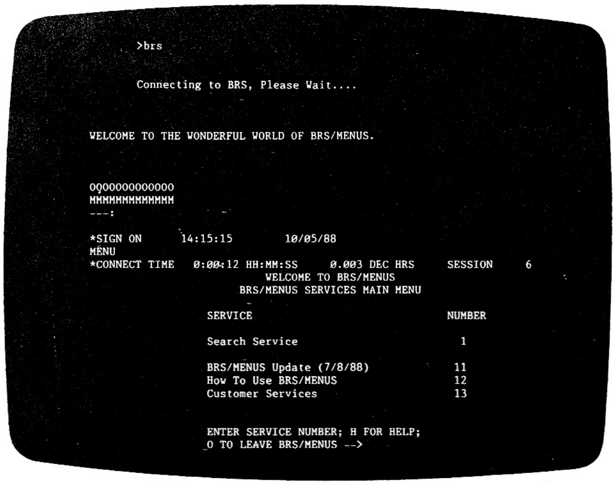
Word and Text Processing

The word and text processing system provides capabilities for text input, editing, and formatting and includes a 56,000-word dictionary for spelling verification. (Multilevel dictionaries may also be created to accommodate company and individual needs.) Other system features include simple commands for global changes, insertions, deletions, margin justification, and paragraph repositioning.

Database Management System (INFOX)

Dialcom's database management system offers data entry, update, query, and computational capabilities for information entry, update query, and report writing. It features plain-English commands, a data dictionary to define file structure, formatted screen development, user-oriented menus, and prompting. Other features include on-line updating, simultaneous file access for transactions, query-type information selection, report generation from multiple files, and sorting capabilities. The system manages:

- Business systems, such as inventory, order entry, accounts payable, and accounts receivable
- Tracking systems for correspondence, grants and loans, procurement, profiles, and competitive data
- Personal systems, such as corporate and individual directories, expense reports, and logs



```
        >brs

        Connecting to BRS, Please Wait....


    WELCOME TO THE WONDERFUL WORLD OF BRS/MENUS.


    0Q00000000000
    MMMMMMMMMMMMM
    ---:

    *SIGN ON       14:15:15        10/05/88
    MENU
    *CONNECT TIME   0:00:12 HH:MM:SS     0.003 DEC HRS     SESSION     6
                              WELCOME TO BRS/MENUS
                          BRS/MENUS SERVICES MAIN MENU

                     SERVICE                                NUMBER

                     Search Service                            1

                     BRS/MENUS Update (7/8/88)                11
                     How To Use BRS/MENUS                     12
                     Customer Services                        13


                     ENTER SERVICE NUMBER; H FOR HELP;
                     O TO LEAVE BRS/MENUS -->
```

Figure 5. Dialcom's gateway to BRS Information Technologies' BRS/Menus service is seamless and surprisingly fast. Naturally, it's more expensive to search BRS/Menus via this route than it is to access it directly.

Correspondence Management

The correspondence and list management system provides tools to automate tasks associated with the production of mailing lists, letters, envelopes, labels, postcards, and directories. Mailing list management facilities include automatic merging, matching, and name search functions to prevent duplication. Mass mailings and correspondence tracking, filing, and retrieval are also accommodated.

NETWORKING SERVICES

Dialcom operates an asynchronous and synchronous X.25 computer network, which can support more than 1,200 simultaneous users. The network offers 600 local dial-up 300/1200 bps asynchronous lines either connected to its processor directly or through its X.25 network. The Dialcom network is accessible, with the appropriate logon ID and password, from any type of ASCII terminal.

Dialcom is also accessible through Telenet and Tymnet, with nationwide access available at any nodes of those Value-Added Networks (VANs). Consequently, if the user's local node is down, he or she has the option of using another route to get onto the system.

Dialcom offers an international access service, the International Travelers Network. This service is available to countries outside the U.S. to connect subscribers into Dialcom's U.S.-based systems. It is designed to enable Dialcom subscribers traveling abroad to avoid the costs and procedural delays involved in obtaining network user identifiers from individual foreign telecommunications authorities.

MICROCOMPUTER/SOFTWARE SERVICES

Dialcom's *UpFront* communications software package provides customized access to Dialcom's electronic mail, telex, and postal delivery messaging services. It includes the following capabilities:

- Full-screen editor to simplify message creation and encryption of sensitive messages and data.
- Folder system to allow the user to track all incoming, outgoing, and sent messages.
- Personal computer forms to allow for easy creation and completion of forms such as invoices, purchase orders, and sales reports.
- Macro language capabilities that enable users to automate the use of various information products and services that are available through Dialcom.
- Address book database to keep track of electronic mail IDs and telex numbers and to automatically fill in the proper information to send a message.

ON-LINE DATABASES

Dialcom offers a number of information products in keeping with the interests of its target market—*Fortune* 1000 companies, associations, and government. These products include electronic newswires, travel services, and bibliographic databases. Most of the databases described below are profiled in the On-line Databases Tab (OL40) in Volume 1 of this Directory.

Business and Management Information

ABI/Inform—provides worldwide coverage of business and management information appearing in more than 650 publications. The database consists of 200-word summaries (abstracts) of the principal articles appearing in leading business journals.

Business Wire—contains the full text of press releases issued by corporations and institutions traded on the New York and American stock exchanges, as well as OTC companies. Over 9,000 companies now use Business Wire for electronic dissemination of their releases.

Daily Tax Report—offers up-to-the-minute information on business accounting and tax news. It is produced by the Bureau of National Affairs.

SEC Advance—contains the full text of the daily Securities and Exchange Commission's News Digest; it is produced by the Bureau of National Affairs.

News

Electronic News Service—provides electronic access to UPI, AP, and OPEC newswires. In addition, the latest stock market and commodities exchange quotations are available through the *Unistox* financial newswire, and 15-minute delayed stock quotes are available from Bunker Ramo Information Systems.

As an adjunct to its electronic news service, Dialcom offers an electronic clipping service, dubbed *News-Tab.* This service enables users to create a personal index of up to 25 key words and phrases. The program then continuously searches the newswires and automatically deposits all stories containing those key words into the user's electronic mailbox.

Federal Government News Service—actually three different database services: *FAR ONLINE*, which provides information on federal acquisitions regulations from the *Federal Register*; *FEDWIRE*, a database of verbatim transcripts from news briefings of the White House and State and Defense departments, and statements by U.S. and foreign officials; and *FEDNEWS*, which consists of press releases issued by government agencies.

McGraw-Hill News—a realtime business news service covering corporation, industry, and government news; and stock market activity. The McGraw-Hill News Snapshot page, updated on the half hour, summarizes the key stock market indicators and the top five business headlines. The Business Calendar feature, updated weekly, outlines anticipated business and economic events and forecasts for the week ahead.

Presidential and Election News Service—provides inside news and analysis concerning election campaigns. Late-breaking news and campaign developments are captured in a 20-page daily *Hotline.* Back issues of the Hotline can be searched for information on a specific candidate or a campaign issue in the PEN *Database.* In 1989, the service will focus on the 1990 races, upcoming redistricting, emerging issues, and hometown paper insights on Washington's Congressional leaders.

Travel

Official Airline Guide—provides information on more than 820,000 direct and connecting schedules from/to more than 105,000 domestic and international locations. OAG details information on departure/arrivals, connections, type of meal service, and aircraft and fare options to or from a particular place. Full information is also available regarding special rate fares, such as "Super Savers."

EAASY SABRE—provided by American Airlines, offers access to information on domestic and international airlines, fares, and schedules; also permits users to book airline, hotel, and car reservations worldwide.

Medical

AIDS-News—a daily, first-alert to AIDS-related news culled from newspapers, wire services, medical journals, and other publications. Features 15 summary articles on research, treatment, legislation, litigation, and other issues. These are automatically sent to the subscribing user's mailbox by 9 a.m. each morning.

IMTS—health and medical news from the International Medical Tribune Syndicate.

Gateways

Through gateway arrangements, Dialcom provides access to the databases offered by two on-line vendors—Dow Jones (Dow Jones News/Retrieval) and BRS Information Technologies (BRS/Menus). The Dow Jones News/Retrieval databases include current and historical stock market quotes, profiles of major U.S. companies, a stock symbol directory, a weekly economic survey, and electronic transcripts of the *Wall $treet Week* television program. BRS/Menus features more than 150 databases covering health, medicine, pharmacology, the biosciences, science and technology, education, business and finance, the social sciences, and the humanities.

OTHER SERVICES

Dialcom offers consulting services in systems analysis, design, and development. Dialcom's program analysts use a variety of languages, including Basic, Fortran, PL/1, Cobol, and Pascal.

FUTURE PLANS

Dialcom has played a key role in the development and implementation of the CCITT standards (known as X.400) for electronic mail, adopted in October 1984. Dialcom is actively marketing its X.400 Message Handling System to international PTTs and corporations interested in making a system purchase or license.

Also, Dialcom has moved its headquarters and computer facilities to Rockville, Maryland. It has also opened new sales offices in San Francisco and London. Dialcom reports that its expansion is positioning it to accommodate the growth it anticipates over the coming years. ☐

DIALOG Information Services, Incorporated

COMPANY INFORMATION

DIALOG Information Services, Inc.
3640 Hillview Avenue
Palo Alto, California 94304 (415) 858-2700

UPDATE: *For DIALOG, the past year was one of its most successful. It expanded and modified many of its services and systems. It added new instructional materials and training seminars, and of course, it provided its on-line users with about 40 new on-line databases in a range of subjects. DIALOG also added several new ONTAP databases, which provide subscribers with low-cost practice searching.*

In many respects the on-line industry's leading database vendor, DIALOG Information Services, Inc., began at Lockheed Corporation in 1965 as an information retrieval research and development project. In 1972, it began offering a commercial search service. Today, DIALOG offers more than 325 databases including over 175 million records covering science, technology, business, medicine, social science, current affairs, news, and humanities. DIALOG also offers an on-line stock quotation and trading service; an electronic mail service; menu-driven subsets of its service tailored to businesspeople, physicians, and biomedical researchers; CD-ROM versions of selected databases; and *Knowledge Index*, a reduced-rate, after-hours service. Other offerings include DIALORDER; an SDI service; DIALINDEX; report preparation; tagged output; and classroom instruction programs.

In July 1988, Knight-Ridder purchased DIALOG from Lockheed for $353 million.

REPORT HIGHLIGHTS: **PAGE**

DIALOG OnDisc **104**
ON-LINE DATABASES **105**

Company Background

Offering more than 325 databases covering numerous subject areas, DIALOG Information Services, Inc. is the preferred on-line vendor for many information professionals. Founded in 1965 as a research and development project of Lockheed, DIALOG first offered an on-line search service in 1972. Its name is now synonymous with on-line databases; and, despite the emergence of many competitors, it remains the industry leader. Until July 1988, DIALOG was a wholly owned subsidiary of Lockheed Corporation; in that month Knight-Ridder announced an agreement with Lockheed to purchase DIALOG for $353 million.

DIALOG states its objective simply and directly: "to provide access to and delivery of civilization's recorded knowledge." With more than 175 million references input from more than 100,000 sources, the company claims it is close to achieving its objective. DIALOG serves more than 100,000 customers in more than 90 countries. Headquartered in Palo Alto, California, DIALOG has offices in Boston; New York; Philadelphia; Washington, DC; Chicago; Houston; and Los Angeles.

DIALOG's databases cover a wide variety of subject areas, including the following:

- Agriculture and nutrition
- Bibliography—Books and Monographs
- Business information
- Chemistry
- Computer technology
- Energy and environment
- Law and government
- Medicine and biosciences
- News
- Patents and trademarks
- Science and technology
- Social sciences/humanities

DIALOG offers an after-hours, reduced-rate service for at-home use. This service, *Knowledge Index*, provides access to more than 75 of DIALOG's databases, covering such topics as engineering, electronics, law, medicine, agriculture, psychology, business, education, and news. Access time for the Knowledge Index service is from 6 p.m. to 5 a.m. (subscriber's time), Monday through Friday; 8 a.m. to midnight on Saturday; and 3 p.m. Sunday to 5 a.m. on Monday.

Competitive Position

DIALOG remains the on-line industry's leading vendor, and the fact that it is now a Knight-Ridder company should only enhance its standing in the industry. Knight-Ridder is one of the leading publishers in the U.S. Its operations span publishing and broadcasting (it operates over 30 newspapers, cable television systems, and information services).

Knight-Ridder incorporated DIALOG into its Business Information Services division in August 1988. The addition of DIALOG doubles the size of the unit, which also includes VU/TEXT Information Services, Inc., Knight-Ridder Financial News, MoneyCenter, Tradecenter, Unicom, The Journal of Commerce, Port Import/Export Reporting Service, and Rapid Access Tariff Expediting Service (RATES). Of these divisions, on-line newspaper vendor VU/TEXT (see Report OL20-961-101) is the closest match to DIALOG, and Knight-Ridder is looking into how the two companies can best work together. Recently, DIA-

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LOG revealed its plans to expand its lineup of major U.S. dailies, with special emphasis on databases now available through VU/TEXT. VU/TEXT offers the largest on-line collection of U.S. newspapers, including 40 regional dailies, and many additional publications.

DIALOG now competes with other database vendors offering a wide selection of both general interest and specialized databases. Its primary competitor is Maxwell Online, with its two divisions: ORBIT Search Service and BRS Information Technologies. Maxwell, which is new to the U.S. on-line market, has established itself quickly and made clear that it plans to be in the industry for the long haul. Prior to the Maxwell purchase, the competitive threat to DIALOG posed by BRS and ORBIT was diminishing. But Maxwell has the resources to forge a strong competitor to DIALOG from its present holdings. Since Maxwell combined BRS and ORBIT, they offer nearly 300 databases and serve more than 60,000 "active passwords." Maxwell plans to shift BRS' focus from a database vendor to strictly software development. Other competitors include NewsNet, Dow Jones News/Retrieval, and Mead Data Central's NEXIS service.

While DIALOG's hold on the library market has never been stronger, the end-user market remains up for grabs. This is a market that does not necessarily recognize DIALOG as the industry leader. In fact, other companies, such as Dow Jones News/Retrieval and Mead Data Central via its NEXIS service may command more of a presence among the end-user market than does DIALOG.

RESOURCES AND FACILITIES

Processing Center

DIALOG's computer facility contains four NAS mainframes, with over 735 billion characters of on-line storage. The DIALOG databank is growing at the rate of nearly 20 billion characters per month.

Availability

The only time the DIALOG system is not available is for a 10-hour period each week on Sunday between 3 a.m. and 1 p.m. U.S. Eastern Time.

Customer Support Services

DIALOG's Customer Service Department offers 24-hour-a-day customer assistance service six days a week and Sunday evening. Customer service representatives answer search questions and solve other customer problems.

Sales and Marketing Services

DIALOG offers *DIALOG Preview*—an introduction to DIALOG for potential customers—and a customer clinic for current users. This service is free, although reservations are required. DIALOG Previews are given in Boston; Chicago; Houston; Los Angeles; New York; Palo Alto; Philadelphia; and Washington, DC. DIALOG also has representatives in Australia, Brazil, Canada, Denmark, England, Finland, France, Mexico, Sweden, and West Germany. Their international distributors are in Argentina, Japan, and Korea.

PROCESSING SERVICES

Pricing

Customers pay for services on an as-used, connect-time basis. DIALOG charges only for its search service and the number of off-line prints requested. Average searches cost $5 to $15, with no minimum or subscription fees; connect time charges include royalties DIALOG pays to its database suppliers.

Table 4 lists the current DIALOG databases with their respective on-line connect charges and off-line print rates. Pricing shown in this table is as of January 1989 and is subject to change.

DIALOG offers three contract options for its users: the Standard Service Agreement, the Commitment Service Agreement, and the Subscription Agreement.

The *Standard Service Agreement* requires no initiation charge or minimum-usage requirement, although there is a $35-per-year annual password fee. Additional passwords can be added for a onetime charge of $35 each.

The *Commitment Service Agreement* discounts the users' on-line connect time. (Discounts do not apply to TYPEs, PRINTs, SDIs, telecommunications, etc.) The user estimates the expected annual expenditure for connect time charges, and receives a discount on usage for each month during which the cumulative usage meets or exceeds the prorated minimum commitment. Multiple passwords are available at no extra charge. The user can request up to one password per $1,000 committed under $20,000; and up to two passwords per $1,000 committed over $20,000.

The *Subscription Agreement* requires the user to prepay an estimated annual expenditure for connect time usage one year in advance. The vendor deducts connect time charges from the monthly balance at the appropriate, discounted rate. With this option, the user can request one password per $1,000 for prepayments up to $20,000, and two passwords per $1,000, for prepayments over $20,000.

A special Subscription Agreement and discount schedule for library networks and other cooperative groups is also available.

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Knowledge Index costs $24 per hour, including telecommunications and database royalties; it requires no monthly minimum charges or usage. A onetime $35 initiation fee includes a password, a self-instructional user manual, and two hours of connect time.

APPLICATION-SPECIFIC SERVICES

DIALOG's databases are continually updated to provide the most current information possible. DIALOG's search system enables searchers to locate information by typing words or phrases describing the topic. Some examples of information that can be searched include titles and abstract words, names of authors or corporations, dates, codes, patent numbers, and other specified portions of the machine-readable records.

Full bibliographic records (references) and abstracts are available, either at the terminal or printed off-line and mailed to the customer. Following a search, the customer may order the full text of the documents located through the search via *DIALORDER*, an on-line document ordering service.

Through simple, basic commands, DIALOG provides the ability to:

- Access DIALINDEX, a multifile index for locating relevant databases
- Select subjects by keyword, person name, place name, date, language, geographic region, organization, and many other elements
- Combine terms to broaden or narrow a search
- Search multiple files without having to reenter search terms
- Print search results on-line
- Tailor output with user-defined formats to include only those parts of the record that are of interest
- Create alternate passwords in addition to the DIALOG-assigned one
- Browse through alphabetically related subject terms
- Access an on-line thesaurus (for some of the databases) for finding related subjects
- Search the full text of records for specific information elements
- Restrict selection to occurrences of subject terms in restricted categories
- Truncate search terms for all possible variances on the root term
- Save search logic for future use
- Order off-line printouts from the terminal
- Order automatic Selective Dissemination of Information (SDI) searches to be run periodically, with results mailed to the user
- Order the full documents or articles of retrieved records

The DIALINDEX multifile index allows users to choose search words or phrases and to determine how frequently the chosen terms appear in various databases, searching the most useful of the selected databases. DIALINDEX is useful when users are not certain which databases are best suited for a specific search.

Using DIALOG OneSearch, users can search multiple databases with a single command. They can compare search results across files, but also modify their search terms, combine search terms, and display results. This modification to the service allows users to search up to 20 files at the same time, producing combined results and output.

DIALOG Business Connection

DIALOG Business Connection is DIALOG's menu-driven service for the business user, providing easy access to data on more than 22 million public and private companies. Users select applications from menus to tap specific information from sources such as Dun and Bradstreet, Standard & Poor's, and Moody's. Six major applications categories are available through the service:

- *Corporate Intelligence*—companies' locations, financial positions, officers, directors, and products.
- *Financial Screening*—user-selected criteria identify companies for potential acquisition or investment.
- *Products and Markets*—market shares, product activities, and trade names for new products or industry marketing plans.
- *Sales Prospecting*—company listings for customer development, telemarketing, or direct mail.
- *Travel Planning—Official Airline Guide Electronic Edition*, flights, fares, hotel and motel information, and OAG's on-line booking service.
- *News*—the complete text of McGraw-Hill News.

A start-up package for the service costs $145, which includes $100 worth of "free" on-line time (for use during the first month), a private password, an IBM-compatible communications software disk, and a user's guide. The same package, without the telecommunications software, is $95. Beyond the start-up costs, users pay only for the time they are actually on-line. Access is charged at $1.40 a minute, or $84.00 per hour, plus report charges. DIALOG reports the average inquiry costs from $5 to $50, depending on the length of the report received.

DIALOG Medical Connection

Geared to professionals in the areas of medicine, biotechnology, pharmacology, and other bioscience disciplines, DIALOG Medical Connection provides menu-driven access to 28 of DIALOG's medical, general reference, and scientific databases. Dialmail, DIALOG's electronic mail service, can also be used by DIALOG Medical Connection subscribers.

The service offers two ways to search for information—a menu mode for new users, and a command mode for experienced users. There are no monthly fees or minimums and

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The local phone numbers are:

Phoenix, AZ	(602) 257-8895	Wilmington, DE	(302) 737-1706	Buffalo, NY	(716) 896-9440
Long Beach, CA	(213) 491-0803	Atlanta, GA	(404) 455-4221	Hempstead, NY	(515) 489-6868
Alahambra/Los Angeles, CA	(818) 300-9000	Chicago, IL	(312) 341-1444	New York, NY	(212) 422-0410
Marina Del Rey, CA	(213) 305-9833	Indianapolis, IN	(317) 635-7259	Rochester, NY	(716) 458-7300
Newport Beach, CA	(714) 756-1969	Boston, MA	(617) 439-7920	White Plains, NY	(914) 328-7810
Oakland, CA	(415) 633-7900	Lexington, MA	(617) 862-6240	Cincinnati, OH	(513) 489-3980
		Baltimore, MD	(301) 234-0940	Cleveland, OH	(216) 621-3807
	(415) 858-0511 (Bell 212)	Ann Arbor, MI	(313) 973-2622	Columbus, OH	(614) 461-8348
Palo Alto, CA	(415) 858-2575 (Bell 003)	Detroit, MI	(313) 964-1309	Dayton, OH	(513) 898-8878
(charged at $4/hour)	(415) 858-2461 (VADIC/Bell)	Portland, OR	(503) 228-2771		
		Minneapolis, MN	(612) 338-0676	Allentown, PA	(215) 776-2030
Sacramento, CA	(916) 444-5030	St. Louis, MO	(314) 731-0122	Valley Forge, PA	(215) 666-1500
San Diego, CA	(619) 297-8610	Research Triangle Park, NC	(919) 549-9290	Philadelphia, PA	(215) 923-5214
San Francisco, CA	(415) 957-5910	Lyndhurst, NJ	(201) 460-8868	Pittsburgh, PA	(412) 471-1421
San Jose, CA	(408) 432-0590	Morristown, NJ	(201) 292-9646	Dallas, TX	(214) 631-9861
Denver, CO	(303) 860-9800	Newark, NJ	(201) 824-1412	Houston, TX	(713) 531-0505
Hartford/Bloomfield, CT	(203) 242-5954	Piscataway, NJ	(201) 562-9680	Salt Lake City, UT	(801) 532-3071
Stamford, CT	(203) 324-1201	Princeton, NJ	(609) 683-5800	Albuquerque, NM	(505) 764-9281
Fairfax, VA	(703) 359-2500				
Washington, DC	(703) 359-2500	Albany, NY	(518) 458-9710	Seattle, WA	(206) 282-5009
Milwaukee, WI	(414) 796-1785				

DIALNET is also accessible through three INWATS numbers
that may be dialed from anywhere in the contiguous United States for access at $18 per hour.
(Within California, only 800/DIALNET may be used.) The numbers are:

800/DIALNET **800/DIALNET** (300/1200/2400 baud)	**800/847-1620** **800/847-1620** (300/1200 baud/ Bell 1200 or VADIC 3400 modem)

Table 1. DIALNET Access Numbers in the United States as of January 1989.

DIALOG's DIALOGLINK telecommunications software is available for optional purchase.

DIALOG OnDisc

DIALOG entered the CD-ROM market in 1986, with its first CD-ROM database, ERIC, the preeminent education database. New for 1988 was an upgraded version (2.11) of the DIALOG OnDisc Manager, DIALOG's CD-ROM search software. Also new are the enhancements provided by Microsoft Extensions software—which includes the ability to use a CD-ROM drive in the same way as a diskette or fixed-disk drive, and the ability to use multiple CD-ROM drives.

DIALOG's OnDisc ERIC was recently enhanced, while OnDisc NTIS was expanded. Also, four new OnDisc products were recently introduced: Agribusiness U.S.A., Canadian Business and Current Affairs, Medline, and Standard & Poor's Corporations.

Previews of these products are available using a special demonstration diskette. Contact DIALOG for further information.

DIALOG now offers DIALOG OnDisc Discovery Preview, a single CD-ROM containing a selected subset of records from eight DIALOG OnDisc products that range in subject areas such as the agricultural industry medical industry, the government, business and finance, and engineering and scientific. This product can be used to practice, train, or experiment with CD-ROM searching and it requires no installation process.

NETWORKING SERVICES

DIALOG offers its own telecommunications network, DIALNET. For access nodes currently installed, see Table 1.

DIALNET offers 300, 1200, or 2400 bps access exclusively to DIALOG. Direct leased lines from the customer's site to DIALNET can accommodate transmission rates of up to 9600 bps. With In-WATS lines, users can also access DIALOG through DIALNET at 2400 bps. Access rates for the network are $10 per hour.

In the U.S. and Canada, service of up to 2400 bps is also available through the Tymnet, Telenet, and TWX networks. Internationally, users may access the DIALOG service through Tymnet, Telenet, or PSS, when available, or through the international Telex network when Tymnet and Telenet are not available. See Table 2 for telecommunications charges for accessing the DIALOG service.

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MICROCOMPUTER/SOFTWARE SERVICES

DIALOGLINK

In addition to the front-end software packages (*DIALOG Medical Connection* and *DIALOG Business Connection*) described under APPLICATION-SPECIFIC SERVICES, DIALOG offers its own communications package, DIALOGLINK. DIALOGLINK consists of two modules: the *Communications Manager* and the *Account Manager*. The Communications Manager provides one-step logon to DIALOG, Knowledge Index, Dialmail, and other user-designated on-line services. Account Manager enables DIALOG users to track their on-line costs for subaccounting and client charge-backs. The complete DIALOGLINK package costs $149. The two component packages are also available separately; the Account Manager must be used in conjunction with the Communications Manager.

ON-LINE DATABASES

DIALOG offers more than 325 on-line databases. Detailed information on most of these databases appears in the On-line Databases section (OL40) in Volume 2 of this publication. Brief descriptions follow.

Agriculture and Nutrition

Agribusiness U.S.A.—abstracts from approximately 300 industry-related trade journals and government publications. The database covers all aspects of agribusiness.

Agricola—contains more than 2,500 records from the USDA Technical Information Systems. The database contains data from 1970 to the present, covering worldwide journal and monographic literature on agriculture and related topics.

Agris International—references to non-U.S. worldwide trade and scientific agriculture literature.

CAB Abstracts—contains more than 2.2 million records from Commonwealth Agricultural Bureaux, covering agricultural and biological information in the 26 main journals published by the Commonwealth Agricultural Bureaus: 8,500 journals in 37 languages.

Connect Time Rate/Hour	U.S. ($)	Canada ($)	Mexico ($)	Europe ($)
DIALNET (DIALOG Information Services Inc.)	10	NA	NA	*10
TYMNET (McDONNELL DOUGLAS CORP.)	12	13	16	NA
TELENET (GTE TELENET COMMUNICATIONS CORP.)	11	12	NA	NA
IN WATS (direct—800#)	24	NA	NA	NA
DIRECT DIAL (Local Access Only)	4	NA	NA	NA

** $5 for users with discount contracts.*

Table 2. Telecommunications Access to the DIALOG Service.

CRIS/USDA—offers more than 30,000 citations, containing agriculturally related research project information from the Current Research Information System of the USDA.

Food Science and Technology Abstracts—from the International Food Information Service, contains more than 367,000 citations, showing research and new development literature in areas related to food science and technology.

Foods Adlibra—contains more than 191,000 citations covering the latest developments in food technology and packaging from 1974 to the present.

Bibliography—Books and Monographs

Book Review Index—is a reference guide to locate the source of published reviews of books and periodical titles.

Books in Print—is a record of forthcoming books, books in print, and books going out of print in the U.S.

British Books in Print—is a comprehensive indexing of books published in the United Kingdom plus other English-language books published worldwide that are available in the U.K.

DIALOG Publications—is a special feature database from DIALOG Information Services, Inc. that allows users to order DIALOG publications on-line.

LC MARC-Books—contains complete records of all books cataloged by the U.S. Library of Congress since 1968.

Remarc—includes over 4.25 million records representing the cataloged collections of the U.S. Library of Congress from 1897 to December 31, 1978.

Business Information

Public Companies

DISCLOSURE Database—contains more than 12,000 records from Disclosure Incorporated, showing extracts from reports filed with the U.S. Securities and Exchange Commission by publicly owned companies.

DISCLOSURE/Spectrum Ownership—contains public corporate ownership information generated from the DISCLOSURE II database and three publications containing data produced by Computer Directions Advisors, Inc.: Spectrum 3 (Institutional Holdings); Spectrum 5 (5 percent Ownership Holdings); and Spectrum 6 (Ownership by Insiders).

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File No.	Database (Supplier)	**On-Line Connect Time Rates		Off-Line Print Rate per Full Record ($)	On-Line Type Rate per Full Record ($)	Report Cost per Data Element ($)
		per Minute ($)	per Hour ($)			
15	ABI/INFORM (UMI/Data Courier)	1.75	105.00	1.30	.80	—
180	ACADEMIC AMERICAN ENCYCLOPEDIA (Grolier Electronic Publishing)	0.75	45.00	0.25 •	—	—
108	AEROSPACE DATABASE (American Institute of Aeronautics and Astronautics, Technical Information Service [AIAA/TIS])	1.45	81.00	0.40	0.40	—
581	AGRIBUSINESS U.S.A. (Pioneer Hi-Bred International, Inc.)	1.60	96.00	0.60	0.50	—
10	AGRICOLA 1979 to Present (U.S. National Agricultural Library)	0.65	39.00	0.20	0.10	—
110	AGRICOLA 1970-1978 (U.S. National Agriculture Library)	0.65	39.00	0.20	0.10	—
203	AGRIS INTERNATIONAL (Food and Agriculture Organization)	0.83	50.00	0.25	0.10	—
306	THE AGROCHEMICALS HANDBOOK (Royal Society of Chemistry)	3.50	210.00	1.35 •	2.35 •	—
§ 9	AIM/ARM (The Center for Vocational Education, Ohio State University)	0.42	25.00	0.10	—	—
460	AMERICAN LIBRARY DIRECTORY (R. R. Bowker)	1.25	75.00	0.40	0.40	—
38	AMERICA: HISTORY AND LIFE (ABC-Clio Information Services)	1.08	65.00	0.15	0.15	—
625	AMERICAN BANKER FULLTEXT (American Banker, Inc.)	2.00	120.00	0.25 •	—	—
Banknews	AMERICAN BANKER NEWS (American Banker, Inc.)	2.00	120.00	0.25 •	—	—
236	AMERICAN MEN AND WOMEN OF SCIENCE (R. R. Bowker)	1.58	95.00	0.40	—	—
305	ANALYTICAL ABSTRACTS (Royal Society of Chemistry)	1.63	98.00	0.60	0.80	—
258	AP NEWS (Daily) Current (Press Association)	1.40	84.00	0.25 •	0.20	—
259	AP NEWS January 1984 to Present (Press Association)	1.40	84.00	0.25 •	0.10	—
45	APTIC (U.S. Environmental Protection Agency)	0.90	54.00	0.20	0.10	—
§ 112	AQUACULTURE (NOAA/EDIS/ESIC/LISD)	0.58	35.00	0.15	0.10	—
★ 44	AQUATIC SCIENCES & FISHERIES ABSTRACTS (Cambridge Scientific Abstracts/Food & Agriculture Organization)	1.45	87.00	0.55	0.50	—
179	ARCHITECTURE DATABASE (British Architectural Library)	1.20	72.00	0.20	0.15	—
191	ART LITERATURE INTERNATIONAL (RILA) (International Repertory of the Literature of Art and J. Paul Getty Trust)	0.70	42.00	0.15	—	—
439	ARTS & HUMANITIES SEARCH (Subscribers) (Institute for Scientific Information)	0.95	57.00	0.52	0.52	—
439	ARTS & HUMANITIES SEARCH (Nonsubscribers) (Institute for Scientific Information)	2.00	120.00	0.52	0.52	—
56	ARTBIBLIOGRAPHIES MODERN (ABC-Clio Information Services)	1.00	60.00	0.15	0.15	—
★ 192	ARTHUR D. LITTLE/ONLINE (Arthur D. Little, Inc.)	1.90	114.00	0.50▲ 100.00 •	0.50▲ 100.00 •	—
102	ASI (Congressional Information Service, Inc.)	1.50	90.00	0.25	—	—
46	A-V ONLINE (Access Innovations)	1.17	70.00	0.20	—	—
297	BIBLE (King James Version) (Thomas Nelson Publishers)	0.40	24.00	0.10	—	—
285	BIOBUSINESS (BIOSIS)	2.15	129.00	0.43	0.40	—
286	BIOCOMMERCE ABSTRACTS (BioCommerce Data Ltd.)	1.50	90.00	0.50	0.50	—
287	BIOGRAPHY MASTER INDEX (Gale Research Company)	1.05	63.00	0.65	0.55	—
5	BIOSIS PREVIEWS 1969 to Present (BIOSIS)	1.55	93.00	0.40	0.32	—
55	BIOSIS PREVIEWS 1981 to Present (BIOSIS)	1.55	93.00	0.40	0.32	—
357	BIOTECHNOLOGY ABSTRACTS (Derwent Publications [Subscribers])	1.33	80.00	0.33	0.18	—
357	BIOTECHNOLOGY ABSTRACTS (Derwent Publications [Nonsubscribers])	2.11	127.00	0.50	0.45	—
626	BOND BUYER FULL TEXT (Bond Buyer, Inc.)	2.00	120.00	0.25 •	—	—
137	BOOK REVIEW INDEX (Gale Research Company)	0.80	48.00	0.25	0.25	—
470	BOOKS IN PRINT (R.R. Bowker)	1.08	65.00	0.20	—	—
430	BRITISH BOOKS IN PRINT (J. Whitaker & Sons Ltd.)	1.00	60.00	0.15	—	—
121	BRITISH EDUCATION INDEX (University of Leeds)	0.75	45.00	0.25	0.25	—
228	BRITISH OFFICIAL PUBLICATIONS (NON-HMSO) (Chadwyck-Healey Ltd.)	0.75	45.00	0.15	0.10	—
635	BUSINESS DATELINE (UMI/Data Courier)	1.90	114.00	4.50 •	4.00 •	—
256	BUSINESS SOFTWARE DATABASE (Information Sources, Inc.)	1.50	90.00	0.90	0.90	—
610	BUSINESSWIRE (Business Wire)	1.60	96.00	0.60 •	—	—
399	CA SEARCH 1967 to Present (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
§ ★ 308	CA SEARCH 1967 to 1971 (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
§ ★ 309	CA SEARCH 1972 to 1976 (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
§ ★ 310	CA SEARCH 1977 to 1981 (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
§ ★ 311	CA SEARCH 1982 to 1986 (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
★ 312	CA SEARCH 1987 to Present (Chemical Abstracts Service)	1.83	110.00	0.45	0.45	—
50	CAB ABSTRACTS 1984 to Present (CAB International)	0.95	57.00	0.35	0.30	—
53	CAB ABSTRACTS 1972 to 1983 (CAB International)	0.95	57.00	0.35	0.30	—
262	CANADIAN BUSINESS AND CURRENT AFFAIRS July 1980 to Present (Micromedia Ltd.)	1.20	72.00	0.20	—	—
159	CANCERLIT (U.S. National Library of Medicine [NLM])	0.60	36.00	0.20	0.05	—
162	CAREER PLACEMENT REGISTRY (Career Placement Registry, Inc.)	1.58	95.00	1.50	1.00	—
580	CENDATA (U.S. Bureau of the Census)	0.60	36.00	0.20 •	—	—
335	CERAMIC ABSTRACTS (American Ceramic Society)	1.33	80.00	0.35	0.15	—
319	CHEMICAL BUSINESS NEWSBASE (CBNB) (Royal Society of Chemistry)	2.75	165.00	1.20	1.75	—

★ Not available through the dialog classroom instruction program.
• Full text database available for on-line display or off-line print.
§ Closed file.
*** Discounts of up to $15 per connect hour available. See schedule 1-D for details.*
† Preformatted reports or crosstab reports available on this file. See schedule 1-F.
▲ Citation.
‡ Table of contents record.
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989.

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File No.	Database (Supplier)	**On-Line Connect Time Rates		Off-Line Print Rate per Full Record	On-Line Type Rate per Full Record	Report Cost per Data Element
		per Minute ($)	per Hour ($)	($)	($)	($)
315	CHEMICAL ENGINEERING ABSTRACTS (Royal Society of Chemistry)	1.63	98.00	0.40	0.80	—
138	CHEMICAL EXPOSURE (Science Applications International Corporation)	0.75	45.00	0.15	—	—
★ 19	CHEMICAL INDUSTRY NOTES (Chemical Abstracts Service)	2.00	120.00	0.50	0.45	—
§ 174	CHEMICAL REGULATIONS & GUIDELINES SYSTEM (CRC Systems, Inc.)	1.17	70.00	0.90	—	—
318	CHEM-INTELL (Chemical Intelligence Services)	0.92	55.00	2.00 16.50 •	2.00 16.50 •	—
301	CHEMNAME (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
§ ★ 328	CHEMSIS 1967 to 1971 (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
§ ★ 329	CHEMSIS 1972 to 1976 (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
§ ★ 330	CHEMSIS 1977 to 1981 (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
§ ★ 331	CHEMSIS 1982 to 1986 (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
★ 332	CHEMSIS 1987 to Present (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
★ 300	CHEMZERO (DIALOG Information Services, Inc. and Chemical Abstracts Service)	3.95	237.00	0.45	0.45	—
632	CHICAGO TRIBUNE (Chicago Tribune Company)	1.45	87.00	0.25	0.10	—
64	CHILD ABUSE AND NEGLECT (National Center for Child Abuse and Neglect)	0.58	35.00	0.10	—	—
★ 344	CHINESE PATENT ABSTRACTS IN ENGLISH (Patent Documentation Service Center of the Peoples Republic of China)	2.00	120.00	0.40	0.40	—
410	CHRONOLOG NEWSLETTER (DIALOG Information Services, Inc.)	0.25	15.00	0.15 •	—	—
101	CIS (Congressional Information Service, Inc.)	1.50	90.00	0.25	—	—
★ 220	CLAIMS/CITATION Prior to 1946 (IFI/Plenum Data Inc.)	1.58	95.00	50.00	50.00	—
★ 221	CLAIMS/CITATION 1947 to 1970 (IFI/Plenum Data Inc.)	1.58	95.00	50.00	50.00	—
★ 222	CLAIMS/CITATION 1971 to Present (IFI/Plenum Data Inc.)	1.58	95.00	20.00	20.00	—
124	CLAIMS/CLASS (IFI/Plenum Data Inc.)	1.58	95.00	0.10	—	—
★ 242	CLAIMS COMPOUND REGISTRY (IFI/Plenum Data Inc.)	1.58	95.00	0.15	—	—
★ 123	CLAIMS/REASSIGNMENT & REEXAMINATION (IFI/Plenum Data Inc.)	1.75	105.00	4.00	3.00	—
340	CLAIMS/U.S. PATENTS (IFI/Plenum Data Inc.)	2.08	125.00	0.50	0.25	—
★ 23	CLAIMS/U.S. PATENTS ABSTRACTS 1950 to 1970 (IFI/Plenum Data Inc.)	2.08	125.00	0.50	0.25	—
★ 24	CLAIMS/U.S. PATENTS ABSTRACTS 1971 to 1981 (IFI/Plenum Data Inc.)	2.08	125.00	0.50	0.25	—
★ 25	CLAIMS/U.S. PATENTS ABSTRACTS 1982 to Present (IFI/Plenum Data Inc.)	2.08	125.00	0.50	0.25	—
★ 125	CLAIMS/U.S. PATENTS ABSTRACTS Weekly (IFI/Plenum Data Inc.)	2.08	125.00	0.50	0.25	—
341	CLAIMS/UNITERM (IFI/Plenum Data Inc.)	5.00	300.00	0.50	0.25	—
★ 223	CLAIMS/UNITERM 1950 to 1970 (IFI/Plenum Data Inc.)	5.00	300.00	0.50	0.25	—
★ 224	CLAIMS/UNITERM 1971 to 1981 (IFI/Plenum Data Inc.)	5.00	300.00	0.50	0.25	—
★ 225	CLAIMS/UNITERM 1982 to Present (IFI/Plenum Data Inc.)	5.00	300.00	0.50	0.25	—
219	CLINICAL ABSTRACTS 1981 to Present (Medical Information Systems)	1.15	69.00	0.25	0.10	—
164	COFFEELINE 1973 to Present (International Coffee Organization)	1.45	87.00	0.30	0.25	—
★ 194	COMMERCE BUSINESS DAILY September 1982 to Current Month (Commerce Business Daily, U.S. Department of Commerce)	0.80	48.00	0.25 •	—	—
★ 195	COMMERCE BUSINESS DAILY (Daily) (Commerce Business Daily, U.S. Department of Commerce)	0.90	54.00	0.25 •	—	—
8	COMPENDEX PLUS (Engineering Information, Inc.)	1.80	108.00	0.47	0.35	—
675	COMPUTER ASAP (Information Access Company)	1.80	108.00	0.95 2.50 •	0.90 2.00 •	—
275	COMPUTER DATABASE (Information Access Company)	1.80	108.00	0.95	0.90	—
77	CONFERENCE PAPERS INDEX (Cambridge Scientific Abstracts)	1.40	84.00	0.50	0.40	—
135	CONGRESSIONAL RECORD ABSTRACTS (National Standards Association)	1.60	96.00	0.25	0.15	—
271	CONSUMER DRUG INFORMATION FULL TEXT (American Society of Hospital Pharmacists)	0.75	45.00	0.30 •	0.20	—
646	CONSUMER REPORTS (Consumers Union of United States, Inc.)	1.00	60.00	0.75 •	0.50 •	—
513	CORPORATE AFFILIATIONS (National Register Publishing Company [NRPC])	1.40	84.00	1.50	1.50	0.10
171	CRIMINAL JUSTICE PERIODICAL INDEX (University Microfilms International)	1.10	66.00	0.25	0.20	—
60	CRIS/USDA (Current Research Information System, U.S. Department of Agriculture)	0.75	45.00	0.15	—	—
358	CURRENT BIOTECHNOLOGY ABSTRACTS (Royal Society of Chemistry)	1.63	98.00	0.40	0.80	—
440	CURRENT CONTENTS SEARCH (Institute for Scientific Information [ISI])	0.70	102.00	0.47 1.66 ‡	0.47 1.66 ‡	—
645	CURRENT DIGEST OF THE SOVIET PRESS (EDAP) (The Current Digest of the Soviet Press)	1.40	84.00	0.25	0.25	—
142	CURRENT TECHNOLOGY INDEX (Library Association [London])	1.15	69.00	0.25	0.25	—
520	D&B—CANADIAN DUN'S MARKET IDENTIFIERS (Dun & Bradstreet Canada Ltd.)	1.67	105.00	2.20	2.20	0.25
575	D&B—DONNELLEY DEMOGRAPHICS (Donnelley Marketing Information Services)	1.00	60.00	12.00	10.00	0.25
511	D&B—DUNS ELECTRONIC DIRECTORY OF EDUCATION (Dun & Bradstreet)	1.00	60.00	0.45	0.45	—
515	D&B—DUNS ELECTRONIC YELLOW PAGES (Dun's Marketing Services)	1.20	72.00	0.30	0.30	0.05
★ 519	D&B—DUNS FINANCIAL RECORDS (Dun & Bradstreet)	2.35	141.00	89.00	89.00	—
516	D&B—DUNS MARKET IDENTIFIERS 10+ (Dun's Marketing Services)	1.67	100.00	2.50	2.50	0.25
518	D&B—INTERNATIONAL DUN'S MARKET IDENTIFIERS (Dun's Marketing Services)	1.75	105.00	2.20	2.20	0.25
517	D&B—MILLION DOLLAR DIRECTORY (Dun's Marketing Services)	1.75	105.00	2.20	2.20	0.25
230	DATABASE OF DATABASES (Gale Research)	0.80	48.00	0.20	—	—

★ Not available through the dialog classroom instruction program.

• Full text database available for on-line display or off-line print.

§ Closed file.

*** Discounts of up to $15 per connect hour available. See schedule 1-D for details.*

† Preformatted reports or crosstab reports available on this file. See schedule 1-F.

▲ Citation.

‡ Table of contents record.

NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

DIALOG Information Services, Incorporated

File No.	Database (Supplier)	**On-Line Connect Time Rates per Minute ($)	**On-Line Connect Time Rates per Hour ($)	Off-Line Print Rate per Full Record ($)	On-Line Type Rate per Full Record ($)	Report Cost per Data Element ($)
267	DE HAEN DRUG DATA (Paul De Haen International, Inc.)	1.10	66.00	0.30	0.25	—
411	DIALINDEX (DIALOG Information Services, Inc.)	0.75	45.00	NA	—	—
415	DIALOG BLUESHEETS ONLINE (DIALOG Information Services, Inc.)	0.25	15.00	0.25	—	—
405	DIALOG HOMEBASE (DIALOG Information Services, Inc.)	0.41	25.00	—	—	—
200	DIALOG PUBLICATIONS (DIALOG Information Services, Inc.)	0.25	15.00	0.15	—	—
Quotes	DIALOG QUOTES AND TRADING (Trade Plus)	0.60	36.00	—	—	—
158	DIOGENES (FOI Inc. and Washington Business Information, Inc.)	1.75	105.00	0.56 4.00 •	0.59 1.95 •	—
100	DISCLOSURE DATABASE (Disclosure Inc.)	0.75	45.00	11.80 ▲ 17.00 •	8.00 ▲ 13.00 •	—
★ 540	DISCLOSURE/SPECTRUM OWNERSHIP (Disclosure Inc.)	1.00	60.00	25.00	25.00	—
35	DISSERTATION ABSTRACTS ONLINE (University Microfilms International)	1.20	72.00	0.25	0.25	—
588	DMS CONTRACT AWARDS (DMS Inc.)	1.40	84.00	0.35	—	0.02 †
★ 984	DMS CONTRACTORS (DMS Inc.)	2.90	174.00	0.30	—	—
988	DMS MARKET INTELLIGENCE REPORTS (DMS Inc.)	2.90	174.00	6.00 •	—	—
★ 103	DOE ENERGY 1983 to Present (U.S. Department of Energy)	1.71	103.00	0.60	0.60	—
★ 104	DOE ENERGY 1974 to 1982 (U.S. Department of Energy)	1.55	93.00	0.60	0.60	—
229	DRUG INFORMATION FULLTEXT (American Society of Hospital Pharmacists)	0.80	48.00	2.50 •	2.00 •	—
565	ECON BASE: TIMESERIES & FORECASTS (WEFA Group)	1.25	75.00	1.00 ▲ 5.00 •	1.00	—
139	ECONOMIC LITERATURE INDEX (American Economic Association)	1.25	75.00	0.15	—	—
241	ELECTRIC POWER DATABASE (Electric Power Research Institute)	1.10	66.00	0.35	0.35	—
173	EMBASE 1974 to 1979 (Elsevier Science Publishers)	1.60	96.00	0.42	0.55	—
172	EMBASE 1980 to 1981 (Elsevier Science Publishers)	1.60	96.00	0.42	0.55	—
72	EMBASE 1982 to Present (Elsevier Science Publishers)	1.60	96.00	0.42	0.55	—
114	ENCYCLOPEDIA OF ASSOCIATIONS (Gale Research Company)	1.65	99.00	0.60	0.50	—
69	ENERGYLINE (R.R. Bowker Company)	2.00	120.00	0.45	0.45	—
293	ENGINEERED MATERIALS ABSTRACTS (Materials Information)	1.50	90.00	0.45	0.40	—
40	ENVIROLINE (R.R. Bowker Company)	2.00	120.00	0.45	0.45	—
68	ENVIRONMENTAL BIBLIOGRAPHY (Environmental Studies Institute)	1.00	60.00	0.15	—	—
1	ERIC (National Institute of Education, Educational Resources Information Center)	0.50	30.00	0.14	0.10	—
316	EUROPEAN DIRECTORY OF AGROCHEMICAL PRODUCTS (Royal Society of Chemistry)	4.15	249.00	1.35	2.35	—
182	EVERYMAN'S ENCYCLOPEDIA (Learned Information Ltd.)	0.70	42.00	0.90 •	0.80 •	—
54	EXCEPTIONAL CHILD EDUCATION RESOURCES (Council for Exceptional Children)	0.58	35.00	0.15	—	—
★ 183	EXPERTNET (ExpertNet Ltd.)	1.00	60.00	0.35	0.25	—
264	FACTS ON FILE (Facts on File, Inc.)	1.00	60.00	0.25 •	— •	—
291	FAMILY RESOURCES (Nat. Council on Family Relations & Inventory of Marriage & Family Literature Proj.)	0.95	57.00	0.25	0.25	—
§ 20	FEDERAL INDEX (National Standards Association)	1.50	90.00	0.20	—	—
136	FEDERAL REGISTER ABSTRACTS (National Standards Association)	1.25	75.00	0.20	—	—
★ 265	FEDERAL RESEARCH IN PROGRESS Abridged Current (National Technical Information Service)	1.30	78.00	0.65	0.60	—
★ 266	FEDERAL RESEARCH IN PROGRESS Unabridged Current (National Technical Information Service)	1.30	78.00	0.65	0.60	—
560	FINANCIAL TIMES COMPANY ABSTRACTS (D-S Production Limited)	1.20	72.00	0.85	0.80	—
622	FINANCIAL TIMES FULLTEXT (Financial Times Business Information Ltd.)	1.60	96.00	1.60 •	—	—
196	FINDEX (Cambridge Information Group Directories, Inc.)	1.75	105.00	0.75	1.50	—
268	FINIS FINANCIAL INDUSTRY INFORMATION SERVICE (Bank Marketing Association)	1.30	78.00	0.30	0.20	—
96	FLUIDEX (BHRA, The Fluid Engineering Centre)	1.15	69.00	0.28	0.18	—
51	FOOD SCIENCE & TECHNOLOGY ABSTRACTS (IFIS GmbH)	1.35	81.00	0.30	0.30	—
79	FOODS ADLIBRA (General Mills)	1.05	63.00	0.15	0.10	—
90	FOREIGN TRADE & ECON ABSTRACTS (Netherlands Foreign Trade Agency)	1.30	78.00	0.30	0.25	—
★ 105	FOREIGN TRADERS INDEX (U.S. Department of Commerce)	0.90	54.00	0.25	0.25	—
26	FOUNDATION DIRECTORY (The Foundation Center)	1.00	60.00	0.30	—	—
27	FOUNDATION GRANTS INDEX (The Foundation Center)	1.00	60.00	0.30	—	—
292	GEOBASE (Geo Abstracts Ltd.)	1.45	87.00	0.30	0.40	—
58	GEOARCHIVE (Geosystems)	1.25	75.00	0.30	0.15	—
89	GEOREF (American Geological Institute)	1.45	87.00	0.45	0.40	—
66	GPO MONTHLY CATALOG (U.S. Government Printing Office)	0.58	35.00	0.10	—	—
166	GPO PUBLICATIONS REFERENCE FILE (U.S. Government Printing Office)	0.58	35.00	0.10	—	—
273	GRADLINE (Peterson's Guides, Inc.)	1.00	60.00	0.95	0.95	—
85	GRANTS (Oryx Press)	1.00	60.00	0.30	—	—

★ Not available through the dialog classroom instruction program.
• Full text database available for on-line display or off-line print.
§ Closed file.
*** Discounts of up to $15 per connect hour available. See schedule 1-D for details.*
† Preformatted reports or crosstab reports available on this file. See schedule 1-F.
▲ Citation.
‡ Table of contents record.
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

DIALOG Information Services, Incorporated

File No.	Database (Supplier)	**On-Line Connect Time Rates		Off-Line Print Rate per Full Record ($)	On-Line Type Rate per Full Record ($)	Report Cost per Data Element ($)
		per Minute ($)	per Hour ($)			
122	HARVARD BUSINESS REVIEW (John Wiley & Sons, Inc.)	1.60	96.00	0.20 ▲	—	—
		—	—	7.50 •	—	—
188	HEALTH DEVICES SOURCE BOOK (ECRI)	1.10	66	1.50	—	0.75
151	HEALTH PLANNING & ADMINISTRATION (U.S. National Library of Medicine)	0.60	36.00	0.20	0.05	—
303	HEILBRON (Chapman & Hall Ltd.)	1.58	95.00	0.85 •	0.65 •	—
39	HISTORICAL ABSTRACTS (ABC-Clio Information Services)	1.08	65.00	0.15	0.15	—
529	HOPPENSTEDT DIRECTORY OF GERMAN COMPANIES (Hoppenstedt Wirtschaftsdatenbank GmbH)	1.75	105.00	3.50	3.50	0.20
561	ICC BRITISH COMPANY DIRECTORY (ICC Online)	1.20	72.00	0.25	0.25	—
562	ICC BRITISH COMPANY FINANCIAL DATASHEETS (ICC Online)	1.60	96.00	4.00 ▲	4.00 ▲	—
		—	—	8.00 •	8.00 •	0.20
563	ICC INTERNATIONAL BUSINESS RESEARCH (ICC Stockbroker Research Ltd., Key Note Ltd., ICC Online Ltd.)	1.40	84.00	4.00	3.00	—
550	IDD M&A TRANSACTIONS (IDD)	1.40	84.00	9.00	9.00	—
189	INDUSTRY DATA SOURCES (Information Access Company)	1.60	96.00	0.40	0.60	—
583	INFOMAT INTERNATIONAL BUSINESS (Infomat Ltd.)	1.60	96.00	0.60	0.50	—
202	INFORMATION SCIENCE ABSTRACTS (IFI/Plenum Data Company)	1.60	96.00	0.35	—	—
★ 345	INPADOC/FAMILY & LEGAL STATUS (International Patent Documentation Center)	2.08	125.00	20.00	20.00	—
549	INSIDER TRADING MONITOR (Invest/Net)	1.40	84.00	0.75	0.75	0.10
§ 12	INSPEC 1969 to 1976 (The Institution of Electrical Engineers)	1.90	114.00	0.65	0.65	—
13	INSPEC 1977 to Present (The Institution of Electrical Engineers)	1.90	114.00	0.65	0.65	—
§ 168	INSURANCE ABSTRACTS (University Microfilms International)	0.92	55.00	0.15	—	—
74	INTERNATIONAL PHARMACEUTICAL ABSTRACTS (Amer. Society of Hospital Pharmacists)	1.15	69.00	0.38	0.27	—
545	INVESTEXT (Technical Data International)	1.60	96.00	4.95 •	4.95 •	—
284	IRS TAXINFO (Internal Revenue Service)	0.60	36.00	0.10 •	—	—
14	ISMEC (Cambridge Scientific Abstracts)	1.40	84.00	0.50	0.40	—
587	JANE'S DEFENSE & AEROSPACE NEWS/ANALYSIS (DMS Inc.)	2.00	120.00	0.75	—	—
612	JAPAN ECONOMIC NEWSWIRE PLUS (Kyodo News Service)	1.60	96.00	0.60	—	—
302	KIRK-OTHMER ONLINE (John Wiley & Sons, Inc.)	1.42	85.00	0.55 •	0.25 •	—
590	KOMPASS EUROPE (Reed Information Services Ltd.)	1.60	96.00	0.50	0.50	0.05
591	KOMPASS U.K. (Information Services Ltd.)	1.60	96.00	0.50	0.50	—
244	LABORLAW I (Bureau of National Affairs)	2.00	120.00	1.20	1.50	—
243	LABORLAW II (Bureau of National Affairs)	2.00	120.00	3.00	3.50	—
426	LC MARC 1980 to Present (U.S. Library of Congress)	0.75	45.00	0.15	0.10	—
427	LC MARC Pre 1980 (U.S. Library of Congress)	0.75	45.00	0.15	0.10	—
150	LEGAL RESOURCE INDEX (Information Access Company)	1.70	102.00	0.40	0.20	—
76	LIFE SCIENCES COLLECTION (Cambridge Scientific Abstracts)	1.45	87.00	0.55	0.45	—
36	LINGUISTICS AND LANGUAGE BEHAVIOR ABSTRACTS (Sociological Abstracts, Inc.)	1.10	66.00	0.50	0.50	—
61	LISA (Library Association Publishing)	1.10	66.00	0.45	0.45	—
† 548	M&A FILINGS (Charles E. Simon & Company)	1.40	84.00	4.00	3.00	0.25 †
647	MAGAZINE ASAP (Information Access Company)	1.60	96.00	0.20 ▲	0.10 ▲	—
		—	—	2.00 •	1.00 •	—
47	MAGAZINE INDEX (Information Access Company)	1.50	90.00	0.40	0.20	—
299	MAGILL'S SURVEY OF CINEMA (Salem Press, Inc.)	0.90	54.00	0.20	—	—
75	MANAGEMENT CONTENTS (Information Access Company)	1.60	96.00	0.80	0.75	—
234	MARQUIS WHO'S WHO, INC. (Marquis Who's Who, Inc.)	2.50	150.00	0.50 ▲	0.40 ▲	—
		—	—	0.50 •	2.50 •	—
141	MARTINDALE ONLINE (The Pharmaceutical Society of Great Britain)	1.05	63.00	0.50	0.85	—
269	MATERIALS BUSINESS (ASM International)	1.50	90.00	0.45	0.40	—
239	MATHSCI (American Mathematical Society)	1.20	72.00	0.46	0.32	—
624	MCGRAW-HILL PUBLICATIONS ONLINE (McGraw-Hill)	1.60	96.00	1.80 •	—	—
600	MCGRAW-HILL NEWS (McGraw-Hill)	1.60	96.00	0.60	—	—
MHNews	MCGRAW-HILL NEWS (Menu-Version) (McGraw-Hill)	1.60	96.00	0.60	—	—
546	MEDIA GENERAL PLUS (Media General Financial Services)	1.20	72.00	4.00	3.00	0.15
152	MEDLINE (1966-1974) (U.S. National Library of Medicine)	0.60	36.00	0.20	0.05	—
153	MEDLINE (1975-1982) (U.S. National Library of Medicine)	0.60	36.00	0.20	0.05	—
154	MEDLINE 1983 to Present (U.S. National Library of Medicine)	0.60	36.00	0.20	0.05	—
155	MEDLINE 1966 to Present (U.S. National Library of Medicine)	0.60	36.00	0.20	0.05	—
86	MENTAL HEALTH ABSTRACTS (IFI/Plenum)	1.60	96.00	0.20	0.10	—
232	.MENU THE INTERNATIONAL SOFTWARE DATABASE (The International Software Database Corp.)	1.00	60.00	0.15	—	—

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§ Closed file.
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† Preformatted reports or crosstab reports available on this file. See schedule 1-F.
▲ Citation.
‡ Table of contents record.
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

DIALOG Information Services, Incorporated

File No.	Database (Supplier)	**On-Line Connect Time Rates		Off-Line Print Rate per Full Record	On-Line Type Rate per Full Record	Report Cost per Data Element
		per Minute ($)	per Hour ($)	($)	($)	($)
304	THE MERCK INDEX ONLINE (A U.S. Publication) (Merck & Co. Inc.)	0.83	50.00	0.40 •	0.20 •	—
Mergers	MERGERS (Charles E. Simon & Company)	1.40	84.00	3.00	—	—
		—	—	1.00 †	—	—
32	METADEX (ASM International)	1.50	90.00	0.45	0.40	—
29	METEOROLOGICAL & GEOASTROPHYSICAL ABSTRACTS (American Meteorological Society, NOAA)	1.58	95.00	0.15	—	—
233	MICROCOMPUTER INDEX (Learned Information, Inc.)	1.00	60.00	0.25	0.25	—
		—	—	3.00 •	3.00 •	—
278	MICROCOMPUTER SOFTWARE GUIDE (R.R. Bowker Company)	1.00	60.00	0.25	0.10	—
248	MIDDLE EAST: ABSTRACTS & INDEX (Northumberland Press)	0.92	55.00	0.25	—	—
249	MIDEAST FILE 1979 to Present (Learned Information, Ltd.)	1.25	75.00	0.30	—	—
71	MLA BIBLIOGRAPHY (Modern Language Association)	1.10	66.00	0.15	0.15	—
557	MOODY'S CORPORATE NEWS—INTERNATIONAL (Moody's Investors Service, Inc.)	1.60	96.00	1.00	1.00	—
556	MOODY'S CORPORATE NEWS—U.S. (Moody's Investors Service, Inc.)	1.25	75.00	0.25	0.25	—
555	MOODY'S CORPORATE PROFILES (Moody's Investors Service, Inc.)	1.00	60.00	4.00	4.00	0.10
★ 78	NATIONAL FOUNDATIONS (The Foundation Center)	1.00	60.00	0.30	—	—
111	NATIONAL NEWSPAPER INDEX (Information Access Company)	1.50	90.00	0.40	0.20	—
21	NCJRS (National Criminal Justice Reference Service)	0.59	35.00	0.30	0.10	—
211	NEWSEARCH (Information Access Company)	2.00	120.00	1.00	1.00	—
		—	—	2.00 •	1.00 •	—
603	NEWSPAPER ABSTRACTS (University Microfilms International)	1.40	84.00	0.30	0.20	—
649	NEWSWIRE ASAP (Information Access Company)	1.60	96.00	0.20	0.10	—
		—	—	2.00 •	1.00 •	—
§ 118	NONFERROUS METALS ABSTRACTS (British Non-Ferrous Metals Technology Center)	0.75	45.00	0.20	0.10	—
6	NTIS (National Technical Information Service, U.S. Department of Commerce)	1.35	81.00	0.65	0.60	—
★ 109	NUCLEAR SCIENCE ABSTRACTS (U.S. Department of Energy)	1.40	84.00	0.40	0.30	—
218	NURSING & ALLIED HEALTH (CINAHL) (Cumulative Index to Nursing & Allied Health Literature Corp.)	0.90	54.00	0.25	—	—
OAG	OAG ELECTRONIC EDITION (Official Airline Guides, Inc.)	0.80	48.00	NA	—	—
161	OCCUPATIONAL SAFETY AND HEALTH (NIOSH) (U.S. Nat. Institute for Occupational Safety & Health)	1.10	66.00	0.40	0.35	—
28	OCEANIC ABSTRACTS (Cambridge Scientific Abstracts)	1.45	87.00	0.55	0.50	—
170	ONLINE CHRONICAL (Online, Inc.)	0.58	35.00	0.30 •	0.15 •	—
215	ONTAP ABI/INFORM (UMI/Data Courier, Inc. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
282	ONTAP AEROSPACE DATABASE (American Institute of Aeronautics and Astronautics, Technical Information Service [AIAA/TIS] and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
385	ONTAP ANALYTICAL ABSTRACTS (Royal Society of Chemistry and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
210	ONTAP AGRICOLA (DIALOG Information Services, Inc. and U.S. Agricultural Library)	0.25	15.00	NA	—	—
255	ONTAP ARTS & HUMANITIES SEARCH (Institute for Scientific Information and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
176	ONTAP ART LITERATURE INTERNATIONAL (RILA)	—	15.00	NA	NA	—
205	ONTAP BIOSIS PREVIEWS (BIOSIS and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
204	ONTAP CA SEARCH (DIALOG Information Services, Inc. & Chemical Abstracts Service)	0.25	15.00	NA	—	—
250	ONTAP CAB ABSTRACTS (CAB International and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
231	ONTAP CHEMNAME (DIALOG Information Services, Inc. & Chemical Abstracts Service)	0.25	15.00	NA	—	—
279	ONTAP CLAIMS (IFI/Plenum Data Co. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
208	ONTAP COMPENDEX (Engineering Information Inc. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
276	ONTAP D&B DUN'S MARKET IDENTIFIERS (Dun's Marketing Services and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
290	ONTAP DIALINDEX (DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
289	ONTAP DMS CONTRACT AWARDS (DMS, Inc. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
272	ONTAP EMBASE (Elsevier Science Publishers and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
201	ONTAP ERIC (Educational Resources Information Center and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
251	ONTAP FOOD SCIENCE & TECHNOLOGY ABSTRACTS (International Food Information Science and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
386	ONTAP KIRK-OTHMER ONLINE (John Wiley & Sons, Inc. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
213	ONTAP INSPEC (The Institution of Electrical Engineers and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
277	ONTAP INVESTEXT (Technical Data International and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
247	ONTAP MAGAZINE INDEX (Information Access Corporation and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—

★ Not available through the dialog classroom instruction program.
• Full text database available for on-line display or off-line print.
§ Closed file.
*** Discounts of up to $15 per connect hour available. See schedule 1-D for details.*
† Preformatted reports or crosstab reports available on this file. See schedule 1-F.
▲ Citation.
‡ Table of contents record.
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

DIALOG Information Services, Incorporated

File No.	Database (Supplier)	**On-Line Connect Time Rates per Minute ($)	**On-Line Connect Time Rates per Hour ($)	Off-Line Print Rate per Full Record ($)	On-Line Type Rate per Full Record ($)	Report Cost per Data Element ($)
254	ONTAP MEDLINE (U.S. National Library of Medicine and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
206	ONTAP NTIS (Nat'l Tech Info. Svc., U.S. Dept. of Commerce and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
212	ONTAP PsycINFO (American Psychological Association and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
281	ONTAP PTS MARKETING AND ADVERTISING REFERENCE SERVICE (MARS) (Predicasts & DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
216	ONTAP PTS PROMT (Predicasts, Inc. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
294	ONTAP SCISEARCH (Institute for Scientific Information and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
207	ONTAP SOCIAL SCISEARCH (Institute for Scientific Information and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
199	ONTAP TAX NOTES TODAY (Tax Analysts and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
296	ONTAP TRADEMARKSCAN (Thomson and Thomson & DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
280	ONTAP WORLD PATENTS INDEX (WPI) (Derwent Publications Ltd. and DIALOG Information Services, Inc.)	0.25	15.00	NA	—	—
252	PACKAGING SCIENCE & TECHNOLOGY ABSTRACTS 1981 to Present (IFIS GmbH)	1.35	81.00	0.30	0.30	—
49	PAIS INTERNATIONAL (Public Affairs Information Service, Inc.)	1.25	75.00	0.40	0.30	—
240	PAPERCHEM (Institute of Paper Chemistry) (Nonsubscriber)	1.65	99.00	0.45	0.35	—
840	PAPERCHEM (Institute of Paper Chemistry) (Subscriber)	1.20	72.00	0.30	0.20	—
144	PASCAL (INIST)	1.00	60.00	0.50	0.50	—
257	P/E NEWS (American Petroleum Institute's Central Abstracting and Indexing Service) (Nonsubscriber)	1.60	96.00	0.35	0.30	—
897	P/E News (American Petroleum Institute's Central Abstracting and Indexing Service) (Subscriber)	1.60	96.00	0.25	0.20	—
★ 214	PETERSON'S COLLEGE DATABASE (Peterson's Guides, Inc.)	0.90	54.00	0.25	—	—
42	PHARMACEUTICAL NEWS INDEX (UMI/Data Courier)	2.32	139.00	0.73	0.60	—
57	PHILOSOPHER'S INDEX (Philosophy Documentation Center)	0.92	55.00	0.15	—	—
41	POLLUTION ABSTRACTS (Cambridge Scientific Abstracts)	1.40	84.00	0.50	0.40	—
91	POPULATION BIBLIOGRAPHY (University of North Carolina, Carolina Population Center)	0.92	55.00	0.10	—	—
613	P.R. NEWSWIRE (P.R. Newswire, Inc.)	1.60	96.00	0.60	—	—
★ 140	PsycALERT (American Psychological Association)	0.92	55.00	0.20	—	—
11	PsycINFO (American Psychological Association)	0.92	55.00	0.20	0.35	—
80	PTS AEROSPACE/DEFENSE MARKETS & TECHNOLOGY (Predicasts) (Nonsubscriber)	2.50	150.00	0.78	0.68	—
980	PTS AEROSPACE/DEFENSE MARKETS & TECHNOLOGY (Predicasts) (Subscriber)	1.85	111.00	0.68	0.58	—
17	PTS ANNUAL REPORTS ABSTRACTS (Predicasts)	2.10	126.00	0.78	0.68	—
98	PTS F&S INDEXES 1972 to 1979 (Predicasts)	1.90	114.00	0.33	0.28	—
18	PTS F&S INDEXES 1980 to Present (Predicasts)	1.90	114.00	0.33	0.28	—
83	PTS INTERNATIONAL FORECASTS (Predicasts)	1.90	114.00	0.48	0.38	—
570	PTS MARKETING AND ADVERTISING REFERENCE SERVICE (MARS) (Predicasts)	2.50	150.00	0.68	0.58	—
621	PTS NEW PRODUCT ANNOUNCEMENTS PLUS (NPA) (Predicasts)	2.10	126.00	1.90 •	0.80 •	—
636	PTS NEWSLETTER DATABASE (Predicasts)	1.60	96.00	0.90	0.60	—
16	PTS PROMT (Predicasts)	2.10	126.00	0.73	—	—
81	PTS U.S. FORECASTS (Predicasts)	1.90	114.00	0.48	0.38	—
82	PTS U.S. TIME SERIES (Predicasts)	1.90	114.00	0.40	0.35	—
450	PUBLISHERS, DISTRIBUTORS, AND WHOLESALERS (R.R. Bowker Company)	1.10	66.00	0.30	0.20	—
190	RELIGION INDEX 1975 to Present (American Theological Library Association)	0.80	48.00	0.17	—	—
421	REMARC Pre 1900 & N.D. (Utlas International)	1.42	85.00	0.35	0.25	—
422	REMARC 1900 to 1939 (Utlas International)	1.42	85.00	0.35	0.25	—
423	REMARC 1940 to 1959 (Utlas International)	1.42	85.00	0.35	0.25	—
424	REMARC 1960 to 1969 (Utlas International)	1.42	85.00	0.35	0.25	—
425	REMARC 1970 to 1980 (Utlas International)	1.42	85.00	0.35	0.25	—
★ 611	REUTERS (Reuters News)	1.60	96.00	0.60 •	—	—
97	RILM ABSTRACTS (City University of New York, International RILM Center)	1.08	65.00	0.15	—	—
432	SCISEARCH 1974 to 1979 (Institute for Scientific Information) (Nonsubscriber) (with cited references)	2.65	159.00	0.52	0.52	—
432	SCISEARCH 1974 to 1979 (Institute for Scientific Information) (Subscriber to print) (with cited references)	1.05	63.00	0.52	0.52	—
433	SCISEARCH 1980 to 1986 (Institute for Scientific Information) (Nonsubscriber) (with cited references)	2.65	159.00	0.52	0.52	—
433	SCISEARCH 1980 to 1986 (Institute for Scientific Information) (Subscriber to print) (with cited references)	1.05	63.00	0.52	0.52	—
434	SCISEARCH 1987 (Institute for Scientific Information) (Nonsubscriber) (with cited references)	2.65	159.00	0.52	0.52	—

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§ Closed file.
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† Preformatted reports or crosstab reports available on this file. See schedule 1-F.
▲ Citation.
‡ Table of contents record.
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

DIALOG Information Services, Incorporated

File No.	Database (Supplier)	**On-Line Connect Time Rates per Minute ($)	per Hour ($)	Off-Line Print Rate per Full Record ($)	On-Line Type Rate per Full Record ($)	Report Cost per Data Element ($)
434	SCISEARCH 1987 (Institute for Scientific Information) (Subscriber to print) (with cited references)	1.05	63.00	0.52	0.52	—
34	SCISEARCH 1988 to Present (Institute for Scientific Information) (Nonsubscriber) (with cited references)	2.65	159.00	0.52	0.52	—
34	SCISEARCH 1988 to Present (Institute for Scientific Information) (Subscriber to print) (with cited references)	1.05	63.00	0.52	0.52	—
70	SEDBASE (Elsevier Science Publishers)	1.35	81.00	3.50	0.30	—
160	SMOKING AND HEALTH (Technical Information Center of the Office on Smoking and Health)	0.75	45.00	0.20	—	—
7	SOCIAL SCISEARCH (Institute for Scientific Information) (Nonsubscriber)	2.00	120.00	0.52	0.52	—
7	SOCIAL SCISEARCH (Institute for Scientific Information) (Subscriber)	1.05	63.00	0.52	0.52	—
37	SOCIOLOGICAL ABSTRACTS (Sociological Abstracts, Inc.)	1.15	69/00	0.45	0.45	—
270	SOVIET SCIENCE AND TECHNOLOGY (IFI/Plenum Data Inc.)	1.58	95.00	0.50	0.40	—
62	SPIN (American Institute of Physics)	0.80	48.00	0.25	0.10	—
48	SPORT DATABASE (Sport Information Resource Centre [SIRC])	1.17	70.00	0.30	0.25	—
§ 65	SSIE CURRENT RESEARCH (Smithsonian Scientific Information Exchange)	1.35	81.00	0.65	0.60	—
526	STANDARD & POOR'S REGISTER—BIOGRAPHICAL (Standard & Poor's Corporation)	1.40	84.00	1.50	1.50	—
527	STANDARD & POOR'S REGISTER—CORPORATE (Standard & Poor's Corporation)	1.40	84.00	1.50	1.50	0.20
133	STANDARD & POOR'S CORPORATE DESCRIPTIONS (Standard & Poor's Corporation)	1.42	85.00	4.00	4.00	—
134	STANDARD & POOR'S NEWS June 79 to June 85 (Standard & Poor's Corporation)	1.42	85.00	0.25	—	—
132	STANDARD & POOR'S NEWS July 85 to present (Standard & Poor's Corporation)	1.60	96.00	0.25	—	—
113	STANDARDS AND SPECIFICATIONS (National Standards Association, Inc.)	1.08	65.00	0.30	0.20	—
238	SUPERTECH (R.R. Bowker Company)	2.00	120.00	0.45	0.45	—
650	TAX NOTES TODAY (Tax Analysts)	1.60	96.00	0.25 •	0.07 •	0.10
TNT	TAX NOTES TODAY, MENU VERSION (Tax Analysts)	1.60	96.00	—	2.00	—
		—	—	—	4.00 •	—
119	TEXTILE TECHNOLOGY DIGEST (Institute of Textile Technology)	1.08	65.00	0.15	0.05	—
536	THOMAS NEW INDUSTRIAL PRODUCTS (Thomas Publishing Company, Inc.)	1.60	96.00	0.50	0.50	0.15
535	THOMAS REGISTER ONLINE (Thomas Publishing Company, Inc.)	1.67	100.00	1.50	1.50	—
648	TRADE & INDUSTRY ASAP (Information Access Company)	1.60	96.00	0.20 ▲	0.10 ▲	—
		—	—	2.00 •	1.00 •	—
148	TRADE AND INDUSTRY INDEX 1981 to Present (Information Access Company)	1.50	90.00	0.40	0.20	—
★ 226	TRADEMARKSCAN—FEDERAL (Thomson & Thomson)	2.00	120.00	0.60	0.60	0.12
★ 226	TRADEMARKSCAN—FEDERAL (Format 19 = Full Format plus Image) (Thomson & Thomson)	2.00	120.00	5.60	2.60	—
★ 246	TRADEMARKSCAN—STATE (Thomson & Thomson)	2.00	120.00	0.60	0.60	0.12
532	TRINET COMPANY DATABASE (Trinet, Inc.)	1.50	90.00	1.60	1.60	0.10
531	TRINET ESTABLISHMENT DATABASE (Trinet, Inc.)	1.50	90.00	0.50	0.50	0.07 †
63	TRIS (U.S. Department of Transportation)	0.75	45.00	0.15	0.05	—
52	TSCA CHEMICAL SUBSTANCES INVENTORY (DIALOG Information Services, Inc. & Environmental Protection Agency)	0.75	45.00	0.15	—	—
480	ULRICH'S INTERNATIONAL PERIODICALS DIRECTORY (R.R. Bowker)	1.08	65.00	0.20	—	—
260	UPI NEWS 1983 to Current Month (United Press International)	1.42	85	0.25 •	0.10	—
261	UPI NEWS Current Daily (United Press International)	1.42	85.00	0.25 •	0.20	—
93	U.S. Political Science Documents (NASA Industrial Applications Center)	1.08	65.00	0.15	—	—
USA Today (Menu)	USA TODAY DECISIONLINE (Gannett News Media)	1.40	84.00	0.20	0.10	—
146	WASHINGTON POST ONLINE (April 1983 to Present) (The Washington Post Company)	1.45	87.00	0.25 •	0.25 •	—
145	WASHINGTON PRESS TEXT (Press Text News Service)	1.15	69.00	0.30 •	0.25 •	—
117	WATER RESOURCES ABSTRACTS (U.S. Department of the Interior)	1.40	84.00	0.45	0.30	—
245	WATERNET 1971 to Present (American Water Works Association)	1.33	80.00	0.20	0.10	—
99	WELDASEARCH (The Welding Institute)	1.40	84.00	0.25	0.20	—
167	WORLD AFFAIRS REPORT (California Institute of International Studies)	1.50	90.00	0.25	0.10	—
33	WORLD ALUMINUM ABSTRACTS (ASM International)	1.50	90.00	0.45	0.40	—
350	WORLD PATENTS INDEX (Derwent Publications Ltd.) (Nonsubscriber)	3.02	181.50	0.86	0.53	—
351	WORLD PATENTS INDEX (Derwent Publications Ltd.) (Subscriber)	1.93	116.00	0.40	0.16	—
67	WORLD TEXTILES (Shirley Institute)	0.92	55.00	0.10	0.05	—
185	ZOOLOGICAL RECORD (BIOSIS)	1.45	87.00	0.30	0.26	—

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§ *Closed file.*
* * *Discounts of up to $15 per connect hour available. See schedule 1-D for details.*
† *Preformatted reports or crosstab reports available on this file. See schedule 1-F.*
▲ *Citation.*
‡ *Table of contents record.*
NA—Not applicable.

Table 3. DIALOG's price schedule as of January 1989 (Continued).

Insider Trading Monitor—is a source for timely and accurate information on insider trading activity.

INVESTEXT—contains investment banking research reports on approximately 8,000 U.S. and 1,500 international companies and industries.

M&A Filings—comprises detailed abstracts of every original and amended merger and acquisition document released by the Securities and Exchange Commission since early 1985.

Media General Plus—provides detailed financial and trading information on 51,000 public companies. The data extends back five years and includes weekly, quarterly, and yearly information on high and low stock prices and volumes. Balance sheets and profit statements, along with many ratios and indexes, are also given for each company.

Moody's Corporate Profiles—is an equity database with financial data and business descriptions of publicly held U.S. companies.

PTS Annual Reports Abstracts—includes 243,000 records of annual reports for over 3,000 publicly held U.S. corporations and selected international companies.

Standard & Poor's Corporate Descriptions—offers in-depth descriptions of more than 9,000 publicly held U.S. corporations.

Corporate Directories

Corporate Affiliations—is the on-line equivalent to the printed *Directory of Corporate Affiliations*. This is a company directory emphasizing the corporate "family tree."

D&B—Dun's Electronic Yellow Pages—lists U.S. businesses, retail services, manufacturers, wholesalers, etc.; includes nearly 8 million listings, with name, location, and line of business.

D&B—Dun's Financial Records Plus—details financial data and key business ratios on more than 750,000 private and public companies, including comparisons with industry norms.

D&B—Dun's Market Identifiers—presents information on more than 2.25 million U.S. business establishments with five or more employees.

D&B—Million Dollar Directory—provides business information on U.S. companies.

Standard & Poor's Register—Biographical—contains personal and professional data on key executives affiliated with public and private, U.S. and non-U.S. companies, with sales of $1 million and over.

Standard & Poor's Register—Corporate—provides information on over 45,000 leading public and private U.S. and some non-U.S. companies, usually with sales in excess of $1 million.

Trinet Company Database—contains information on both public and private manufacturing and nonmanufacturing companies in all product areas and sectors of industry. Includes current address, and financial and marketing information on U.S. single- and multiestablishment companies.

Trinet Establishment Database—is a directory of U.S. corporate establishments, with address, sales, market shares, employees, and headquarters information.

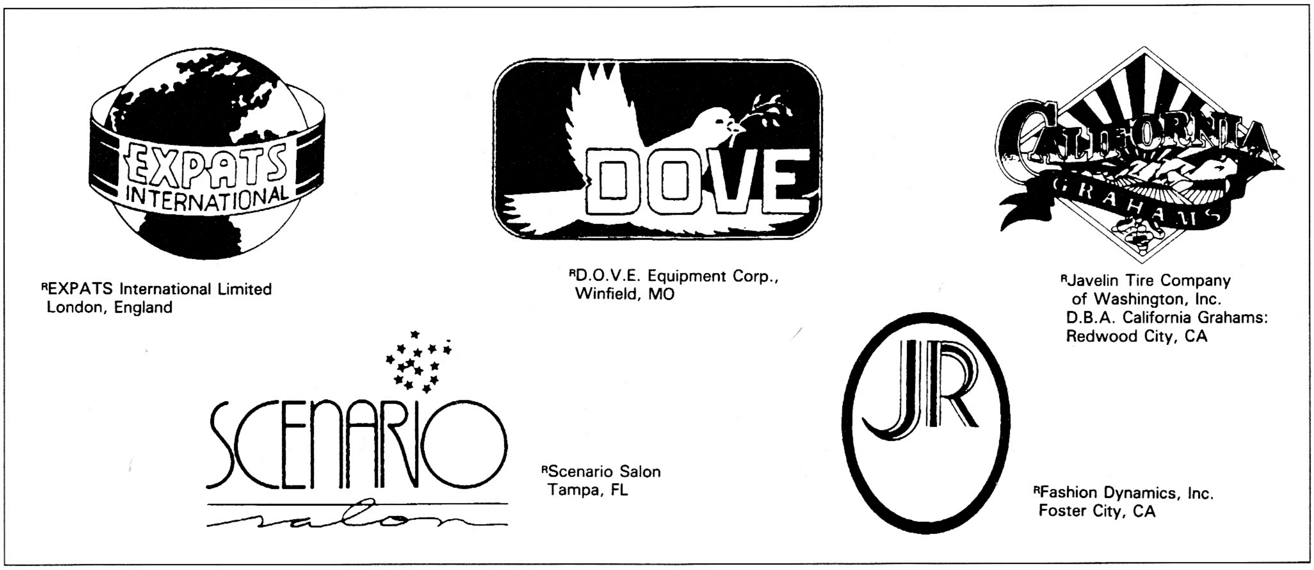

Figure 1. DIALOG was the first mainstream on-line vendor to offer graphic images on-line. Over 40 percent of the more than 780,000 text records in the DIALOG database Trademarkscan—Federal include graphic representations of U.S.-registered trademarks that have designs.

DIALOG Information Services, Incorporated

International Companies

Infomat International Business—contains concise abstracts of international business news articles taken from more than 400 business newspapers and journals, translated into English from 10 languages.

D&B—Canadian Dun's Market Identifiers—contains current addresses and financial and marketing data, including annual sales volume in both Canadian and U.S. dollars, for approximately 350,000 Canadian companies.

D&B—International Dun's Market Identifiers—comprises directory listings, sales volume and marketing data, and references to parent companies for more than 500,000 non-U.S. companies.

Foreign Traders Index—provides more than 72,000 records from the U.S. Department of Commerce, containing a directory of manufacturers, service organizations, agent representatives, retailers, wholesalers, distributors, and cooperatives in 130 countries outside the U.S.

Hoppenstedt Germany—covers the major 35,000 German companies with sales exceeding DM 2.5 million or a minimum of 40 employees.

ICC British Company Directory—provides a listing of company name and address, year of incorporation, accounts reference date, and dates of latest returns and accounts for every limited liability company in Scotland, England, and Wales.

ICC British Company Financial Datasheets—are available for over 100,000 British companies, including the majority of quoted and unlisted securities market companies, up to 100 leading companies in 140 selected industry sectors, and a comprehensive selection of the remaining companies in those sectors.

ICC International Business Research—references the full text of international corporate and industry reports gathered from investment research reports published by leading British and international analysts.

Kompass Europe—is a directory containing 230,000 records produced by a consortium of five European publishing groups, providing business information, for about 210,000 European companies in Denmark, France, Italy, Norway, Sweden, West Germany, and the United Kingdom.

Kompass UK—covers approximately 257,000 companies in the United Kingdom that supply approximately 45,000 classes of products. The database covers establishments in the business-to-business sector with an emphasis on manufacturing, industrial, and associated service sectors.

Moody's Corporate News—International—offers coverage of business news and financial information on more than 3,900 major corporations and institutions in 100 countries worldwide.

Economic Data

Cendata—provides the U.S. Bureau of the Census (BOC) news releases and statistical data based on current economic and demographic reports.

ECONBASE: Time Series and Forecasts—contains a broad range of econometric time series covering subject areas such as economics, business conditions, finance, manufacturing, household income distribution, and demographics.

D&B—Donnelley Demographics—contains 1980 population census data; current-year estimates; five-year projections for each state, county, place, zip code, Metropolitan Statistical Area, Area of Dominant Influence, Designated Marketing Area; as well as a U.S. summary. The database covers age, race, sex, industry, occupation, marital status, families, households, education, housing, income, and other topics.

PTS International Forecasts—covers more than 736,000 citations from Predicasts Inc., containing abstracts of published forecasts with historical data for all countries excluding the U.S.

PTS U.S. Forecasts—includes more than 500,000 citations from Predicasts Inc., containing abstracts of published forecasts for the U.S.

PTS U.S. Time Series—includes more than 36,500 citations containing 500 time series of historical data and projected consensus of published forecasts through 1990 for the U.S.

Financial News

American Banker—corresponds to the printed publication of the same name, which is considered an authoritative source for news in the banking industry.

American Banker News—is a companion file to the *American Banker* database. This file is menu driven and contains the key news stories (not the full editorial content) appearing in the *American Banker.*

Bond Buyer Full Text—is a source for news on debt issues, and a tool for those who manage and trade long-term debt instruments, including bankers and corporate treasurers; corresponds to the printed publication.

DIALOG QUOTES and TRADING—provides gateway access to the stock and options quotation and transaction service of Trade*Plus, covering the NYSE, ASE, NASDAQ, and four major option exchanges; information is available 15 minutes after announcement.

Financial Times Company Abstracts—contains informative abstracts of all articles that refer to a particular company and that are published in the London and Frankfurt editions of *The Financial Times Newspaper.*

Standard & Poor's News—offers general news and financial information on more than 10,000 publicly owned U.S. companies.

Markets, Products, Technologies

Arthur D. Little/Online—provides an index to the nonexclusive information sources of Arthur D. Little, Inc., its divisions, and subsidiaries. Providing broad coverage of industries, technologies, and management topics, this database contains references to forecasts, planning reports assessments, and development reports.

FINDEX: The Directory of Market Research Reports, Studies, and Surveys—indexes and describes all industry and market research reports, studies, and surveys from over 300 U.S. and international publishers.

Health Devices Sourcebook—is a directory file produced by ECRI, contains 8,400 records with current address and marketing information on the North American manufacturers and distributors of more than 4,000 classes of medical devices.

Industry Data Sources—contains information on bibliographic sources of financial and marketing data for 65 major industries.

McGraw-Hill Publications Online—provides the complete text for many major McGraw-Hill publications including *Aviation Week & Space Technology, Electrical Marketing, Platt's Oilgram Price Report, Securities Week, and Waste-to-Energy Report.* The on-line database covers not only general business but also specific industries. The complete text of each article is searchable and can be retrieved online in addition to being printed off-line.

PTS F&S Indexes—contains more than 3,200,000 citations, covering 1972 to the present from Predicasts Inc., including domestic and international company, product, and industry information.

PTS Promt—contains 25,000 records from the PTS Promt database. It provides a low-cost PTS database that can be used for training purposes.

Industries

BioBusiness—comprises summaries of business-oriented articles in the agriculture, biotechnology, food and beverage industries, and pharmaceuticals.

Biocommerce Abstracts—contains indexes and abstracts of news items concerned with the business aspects of biotechnology and the commercial applications of biological sciences.

Chemical Business Newsbase—contains abstracts of international trade and business journal articles, market research and stock broker reports, and other documents on the chemical industry.

Chemical Industry Notes (CIN)—provides extracts from articles from 80 worldwide business-oriented periodicals covering the chemical processing industries from 1974 to the present.

Coffeeline—summarizes articles and data from over 5,000 publications covering all aspects of coffee research.

FINIS: Financial Industry Information Service—provides marketing information on organizations that comprise the financial services industry and on products and services offered to corporate and retail customers.

NEW DATABASES

Academic Index
AIDSLINE
Asia-Pacific
Arts & Humanities Search
Biotechnology Abstracts
British Education Index
CanCorp
Ceramic Abstracts
Chemical Engineering Abstracts
Chemical Safety Newsbase
Chemsearch
Chicago Tribune
Computer ASAP
Courier Plus
Current Biotechnology Abstracts
Current Contents Search
Current Digest of The Soviet Press
DIALOG Bluesheets
EBIS—Employee Benefits Info Source
European Directory of Agrochemical Products
Expertnet
Health Devices Alerts
Health Devices Sourcebook
ICC International Business Research
IDD M&A Transactions
IHS International Standards and Specifications
Inpadoc/Family and Legal Status
Insider Trading Monitor
Insurance Periodicals Index
Knight-Ridder Financial News
Kompass Europe
Laborlaw II
McGraw-Hill News
Microsoftware Directory (SOFT)
Pascal
PTS Newsletter Database
SEDBASE
Tax Notes Today
USA Today Decisionline
USATODAY

Table 4. New databases available as of January 1989.

DIALOG Information Services, Incorporated

▷ *Insurance Abstracts*—covers specialized literature of life, property, and liability insurance.

PTS Marketing & Advertising Reference Service—contains over 5,000 records from the database of the same name. This database is used for training purposes.

Product Listings and Announcements

PTS New Product Announcements—is composed of news releases from thousands of companies and their authorized marketing representatives. The database covers all industries.

Thomas New Industrial Products—contains current information on new industrial products and systems.

Thomas Register Online—covers approximately 133,000 U.S. manufacturers, with over 50,000 classes of products, and over 106,000 trade or brand names including what is made in the U.S., where it is made, and who makes it.

General Business Information

ABI/Inform—contains more than 422,000 records from Data Courier, Inc., scanning approximately 800 primary publications in business and related fields for general decision science information covering all phases of business management and administration.

Economic Literature Index—is an index of journal articles and book reviews from economics journals and monographs.

Foreign Trade & Econ Abstracts—covers the world's literature on markets, industries, country-specific economic data, and research in the fields of economic science and management.

Harvard Business Review—contains full text of *Harvard Business Review* from 1976, and citations and abstracts from 1971 to the present.

Management Contents—comprises more than 270,000 citations from 120 U.S. and foreign journals on a variety of business- and management-related topics.

Business News

Businesswire—consists of timely, full-text news stories that are simultaneously distributed to more than 700 news media and to more than 100 institutions and firms in the investment community.

Business Dateline—accesses the full text of articles from 110 regional business publications from throughout the U.S. and Canada.

Financial Times Fulltext—is the complete text of all articles published in the London and international editions of *The Financial Times Newspaper.*

M&A Filings—contains detailed abstracts of every original and amended merger and acquisition document released by the Securities and Exchange Commission since early 1985.

McGraw-Hill News—provides the complete text of current news stories covering top business events around the world. The database covers company and industry news, activity on U.S. and foreign stock markets, economic indicators and economic forecasts, U.S. government news as it pertains to daily business operations, and political and general news where it may significantly affect the business community.

Mergers—is the menu-driven version of *M&A Filings.*

Newswire ASAP—is complete text and comprehensive indexing of news releases and wire stories from three wire services—PR Newswire, Kyodo, and Reuters.

PR Newswire—contains the complete text of news releases prepared by companies; public relations agencies; trade associations; city, state, federal, and foreign government agencies; and other sources covering the entire spectrum of the news.

PTS Newsletter Database—contains over 62,000 records including the full text of specialized industry newsletters that provide concise information on companies, products, markets, and technologies; trade and geopolitical regions of the world; and government funding, rulings, and regulation and other legislative activities that impact the industries and regions covered.

Reuters—is the complete text of news releases from the *Reuter Library Service* newswire. The database offers access to current (updated every 15 minutes) information and international news.

Trade & Industry ASAP—contains over 500,000 records providing complete text and indexing for over 85 journals plus news released from *PR Newswire.* Records date back from 1983 to the present.

Trade & Industry Index—contains business journals relating to trade, industry, and commerce that are indexed and selectively abstracted.

International Business Information

Canadian Business and Current Affairs—provides indexing to more than 100,000 articles per year, appearing in 500 Canadian business periodicals and 10 newspapers.

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> *Japan Economic Newswire Plus*—comprises the complete combination of all English-language newswires as reported by Kyodo News Service, Tokyo, Japan.

Travel

OAG Electronic Edition—provides comprehensive information on more than 1,500,000 direct and connecting airline schedules worldwide, and on over 600,000 North American fares. It includes all licensed airlines flight schedules—schedule information includes departure and arrival times, aircraft type, meal service, and number of stops.

Chemistry

Agrochemicals Handbook—contains information on the active components found in agrochemical products used worldwide.

Analytical Abstracts—is devoted to all aspects of analytical chemistry: general applications, inorganic chemistry, organic chemistry, pharmaceutical chemistry, environmental agriculture, etc.

CA Search—contains more than 8.5 million records from 1967 to the present. Prepared by the American Chemical Society, this database contains basic bibliographic information from *Chemical Abstracts,* CA General Subject Headings from a controlled vocabulary, and the CAS Registry Numbers.

Chem-Intell—provides information on manufacturing plants and trade and production figures for more than 100 organic and inorganic chemicals.

Chemical Engineering Abstracts—contains about 88,000 records and provides information on industrial practice and theoretical chemical engineering. The information dates back to 1971 and extends to the present.

Chemical Exposure—is a comprehensive database of chemicals that have been identified in both human tissues and body fluids, and in feral and food animals.

Chemical Regulations and Guidelines System (CRGS)—is an index to U.S. federal regulatory material relating to the control of chemical substances.

Chemname—is a listing of more than 1.7 million chemical substances in a dictionary-type, nonbibliographic format, specifying available synonyms, ring data, and other chemical substance information.

Chemsis—is a nonbibliographic, dictionary file containing those chemical substances cited once during a Collective Index Period of *Chemical Abstracts.* It contains over 5 million records, it is updated monthly, and the information dates to 1967.

Chemzero—is a nonbibliographic, dictionary file containing those chemical substances for which there are no citations in the *CA Search* files. The file is updated monthly and contains approximately 1 million files.

Claims Compound Registry—is a dictionary of 14,400 chemical compounds. Each record contains the IFI compound term number, main compound name, synonyms, molecular formula, and fragment codes and terms.

European Directory of Agrochemical Products—provides data on agrochemical products manufactured or marketed primarily in Western Europe.

Heilbron—contains chemical identification, physical-chemical properties, use, hazard, and key reference data to the world's more important chemical substances, as selected by a panel of experts.

Kirk-Othmer Online—provides a treatise of applied chemical science and industrial technology, its methods and materials, as well as the latest scientific advancements in every branch of the useful arts of chemistry.

Paperchem—comprises indexes and abstracts of scientific and technical literature dealing with raw materials, principles, processes, technology, and products of the pulp and paper industry.

Ringdoc—is a collection of three databases, providing access to pharmaceutical information. The historical database provides information from 1964 through 1982 containing over 800,000 records.

TSCA Chemical Substances Inventory—is a nonbibliographic dictionary listing chemical substances in commercial use in the U.S. as of June 1, 1979.

Computer Technology

Business Software Database—describes more than 11,500 microcomputer- and minicomputer-based business application software packages.

Computer ASAP—provides complete text and indexing for 70 percent of the articles currently indexed in a companion file, *Computer Database.* The file includes about 59,000 records and is updated weekly.

Computer Database—contains abstracts from 530 journals, newsletters, tabloids, proceedings, and meeting transactions as well as business books and self-study courses. Covering the major aspects of computers, telecommunications, and electronics.

Inspec—comprises more than 3.2 million citations from the Institution of Electrical Engineers, covering Science Abstracts from 1969 to the present. ▷

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.MENU—International Software Database—lists commercially available software for any type of minicomputer or microcomputer. The database corresponds to the printed work of the International Microcomputer Software Directory.

Microcomputer Index—is a subject and abstract guide to magazine articles from 40 microcomputer journals.

Microcomputer Software Guide—contains information on microcomputer software programs and hardware systems available or produced in the U.S.

Energy and Environment

Aquaculture—contains more than 10,000 records, covering information on growing brackish, freshwater, and marine organisms.

Aquatic Science and Fisheries Abstracts—contains more than 270,000 records, covering the life sciences of the seas and inland waters and related legal, political, and social topics.

DOE Energy—contains literature references on all aspects of energy and related topics.

Electric Power Database—includes 27,000 records relating to research and development projects of interest to the electric power industry, including hydroelectric power, fossil fuels, nuclear power, and more.

Energyline—provides more than 65,000 citations from Environment Information Center, Inc., covering 1971 to the present. Energyline is the machine-readable version of Energy Information Abstracts.

Enviroline—covers the world's environmental information dating from 1971 to the present.

Environmental Bibliography—accesses more than 355,000 records, indexing more than 300 periodicals covering the fields of general human ecology, atmospheric studies, energy, land resources, water resources, nutrition, and health.

Nuclear Science Abstracts—is an abstract and index collection of international nuclear science and technology literature.

Oceanic Abstracts—makes available more than 191,000 records, organizing and indexing technical literature on marine-related subjects.

P/E News—covers current political, social, and economic information related to the energy industry.

Pollution Abstracts—references more than 142,000 citations on pollution, its sources, and its control.

Water Resources Abstracts—covers water-related topics, including water resource economics, ground and surface water hydrology, metropolitan water resources planning and management, and water-related aspects of nuclear radiation and safety.

Waternet—is an index of the publications of the American Water Works Association and the AWWA Research Foundation. It emphasizes the technical reports and studies from water utilities, regulatory agencies, and research groups in the U.S., Canada, Mexico, Latin America, Europe, and Asia.

Law and Government

ASI—the American Statistics Index from Congressional Information Service, Inc. contains more than 140,500 records. It provides an index of the statistical publications from more than 400 central or regional issuing agencies of the U.S. government. Information is updated monthly.

British Official Publications—corresponds to the hard copy bimonthly publication *Catalogue of British Official Publications Not Published by HMSO* (Her Majesty's Stationery Office). This publication catalogs and indexes British official publications issued directly by government departments and other government agencies not published by HMSO.

CIS—accesses more than 257,500 records from Congressional Information Service, Inc.; the machine-readable form of the Index to Publications of the United States Congress.

Commerce Business Daily—is the complete text equivalent to the printed publication, *Commerce Business Daily*, announcing products and services offered or wanted by the U.S. government.

Congressional Record Abstracts—provides comprehensive abstracts covering each issue of *The Congressional Record.*

Criminal Justice Periodical Index—is a comprehensive index of 120 administration of justice and law enforcement periodicals and journals.

Federal Index—provides coverage of such federal actions as proposed rules, regulations, bill introductions, speeches, hearings, roll calls, reports, vetoes, court decisions, executive orders, and contract awards.

Federal Register Abstracts—provides coverage of federal regulatory actions.

GPO Monthly Catalog—contains the machine-readable Monthly Catalog of United States Government Publications. Features nearly 300,000 records.

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GPO Publications Reference File—indexes public documents for sale by the Superintendent of Documents, U.S. Printing Office, and upcoming and recently out-of-print publications.

IRS Taxinfo—comprises the complete text of 71 IRS publications that provide information on individual income tax returns. Contains 2,946 records; updated annually.

Laborlaw—provides summaries relating to decisions on labor relations, fair employment, wages and hours, and occupational safety and health.

Laborlaw II—accesses indexes and abstracts of U.S. federal, state, and administrative agency decisions pertaining to labor relations. Contains 4,000 records; updated monthly.

Legal Resource Index—indexes over 750 key law journals and five law newspapers, plus legal monographs and government publications from the Library of Congress MARC database.

NCJRS—covers more than 93,500 records from the National Criminal Justice Reference Service, covering all aspects of law enforcement and criminal justice from 1972 to the present.

Tax Notes Today—contains analytical summaries combined with the full text of important legislative, regulatory, judicial, and policy documents regarding federal taxation.

Washington Presstext—contains complete text of White House and U.S. Department of State news releases, policy statements, and background information.

Medicine and Biosciences

BIOSIS Previews—accesses more than 6.1 million citations, providing comprehensive, worldwide coverage of research in the life sciences.

Biotechnology Abstracts—covers data on the scientific and technical aspects of biotechnology and other technocommercial information related to the field.

Cancerlit—comprises abstracts that appeared in *Carcinogenesis Abstracts* from 1963 to 1969 and in *Cancer Therapy Abstracts* from 1967 to 1979.

Chemical Exposure—is a comprehensive database of chemicals that have been identified in both human tissues and body fluids, and in feral and food animals.

Clinical Abstracts—provides access to more than 300 leading English-language medical journals covering all aspects of clinical medicine.

De Haen Drug Data—is a comprehensive database containing four major subfiles, each covering a different aspect of drug information. The four subfiles included are *De Haen's Drugs in Prospect*, *De Haen's Drugs in Use*, *De Haen's Drugs in Research*, and *De Haen's ADRIS* (Adverse Drug Reactions & Interactions System).

Diogenes—provides access to the FDA regulatory information needed by the health care industry. The file includes news stories and unpublished documents relating to the United States regulation of pharmaceuticals and medical devices.

Drug Information Fulltext—corresponds to two printed publications: the *American Hospital Formulary Service*, containing information on 1,000 drugs available commercially in the United States; and the *Handbook of Injectable Drugs*, covering 217 commercially available and 57 investigational drugs used in the United States.

Excerpta Medica—contains more than 3.7 million records from Excerpta Medica, covering biomedical literature from 1974 to the present.

Health Planning and Administration—references nonclinical literature on all aspects of health care planning and facilities; health insurance; and the aspects of financial management, personnel administration, work force planning, and licensure and accreditations that apply to the delivery of health care.

International Pharmaceutical Abstracts—provides information on all phases of the development and use of drugs and on professional pharmaceutical practice. It contains over 140,000 records, and is updated monthly.

Life Sciences Collection—contains more than 1 million records covering 15 journals from 1978 to the present. Subject areas include animal behavior, biochemistry, ecology, entomology, genetics, immunology, microbiology, toxicology, and virology.

Martindale Online—is a full text database on drugs and medicines providing details on the various aspects of a drug's properties or activities.

MEDLINE—indexes articles to over 3,000 international journals containing information in the field of biomedicine.

Mental Health Abstracts—comprises more than 472,000 records containing worldwide information relating to the general topic of mental health. Information covers 1969 to the present.

The Merck Index Online—is an updated and expanded version of the printed 10th Edition of *The Merck Index*, an internationally recognized one-volume encyclopedia of chemicals, drugs, and biologicals.

Nursing and Allied Health (CINAHL)—covers a wide range of subjects, including nursing and health education, medi-

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cal and laboratory technology, occupational therapy, health science librarianship, and social service in health care.

Occupational Safety and Health (NIOSH)—covers all aspects of occupational safety and health, and includes such topics as hazardous agents, unsafe workplace environments, and toxicology.

Pharmaceutical News Index—contains more than 260,000 citations from Data Courier Inc., covering 1974 to the present and giving current news about pharmaceuticals, cosmetics, medical devices, and related health fields.

SEDBASE—is the full text of the 10th edition of *Meyler's Side Effects of Drugs*, and text from *Side Effects of Drugs Annals*, and synonyms of drug names from *Pharmacological and Chemical Synonyms.*

Smoking and Health—accesses bibliographic citations and abstracts to journal articles, reports, and other literature that discuss the effects of smoking on health.

Sport—is an international bibliographic database covering all aspects of sport, fitness, and recreation.

Zoological Record—provides 740,000 records of worldwide coverage of zoological literature, with particular emphasis on systematic/toxonomic information.

News

AP News—provides full text of national, international, and business news from the AP DataStream service.

Chicago Tribune—is the full text of stories published in the *Chicago Tribune*, a general circulation newspaper providing local, national, and international coverage. It contains information from January 1988 to the present and is updated daily.

Chronolog Newsletter—is the on-line version of the DIALOG Information Retrieval Service monthly publication.

Current Digest of the Soviet Press—is the on-line equivalent of the weekly English-language journal of the same name. It contains translations and abstracts from Soviet newspapers and magazines.

Facts On File—is a weekly record of contemporary history compiled from worldwide news sources. It covers politics, government, business and the economy, medicine, sports, foreign affairs, the arts, and other news topics.

Middle East: Abstracts and Index—is a major source of current information about activities and developments in the Arab world and other countries in the Middle East. The database covers politics, economics, history, sociology, psychology, and education.

Mideast File—covers a wide range of information on all aspects of life and work in the Middle East.

National Newspaper Index—contains more than 1.6 million records from Information Access Company, providing indexes of *The Christian Science Monitor, The New York Times, The Wall Street Journal, The Los Angeles Times,* and *The Washington Post* from 1979 to the present.

Newspaper Abstracts—contains comprehensive indexing for 19 major regional, national, and international newspapers. It also contains, in most cases, brief article abstracts.

Newsearch—indexes more than 2,000 current-month news stories, information articles, and book reviews per day from Information Access Company. More than 1,700 important newspapers, magazines, and periodicals are covered.

Online Chronicle—is a full-text source for the latest news in the on-line industry.

PAIS International—contains more than 311,000 citations from Public Affairs Information Service, Inc., covering information in all fields of social science.

UPI News—contains the full text of news stories carried on the United Press International wire service.

USA Today Decisionline—comprises daily news summaries of major events, issues, and trends affecting the U.S.

USA Today—is a menu-driven database that offers a quick read on the significant developments of the day's top news in 18 categories. The database includes approximately 2,000 records and is updated daily (Monday through Friday).

Washington Post Online—is the electronic version of the morning daily and Sunday *Washington Post.* It contains information from 1983 to the present, and is updated daily.

World Affairs Report—provides subject-by-subject and country-by-country analysis of the Soviet attitude toward world developments, based on Soviet and non-Soviet sources.

Patents and Trademarks

Chinese Patent Abstracts in English—references all patents published in the People's Republic of China since the opening of the Chinese patent office April 1, 1985.

Claims/Citation—includes all patent numbers cited in the U.S. from 1947 to 1981. The database is designed to answer the question of which later patents cite another patent.

Claims/Reassignment & Reexamination—contains information on the current status of U.S. patents. This database

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tracks those patents whose ownership has been reassigned from the original assignee to another company or individual.

Claims/Reference—is a dictionary index to the subject classification that the CLAIMS family of databases uses.

Claims/U.S. Patent Abstracts—from IFI/Plenum Data Company, contains citations and abstracts for all patents classified by the U.S. Patent Office for selected technical and scientific areas from 1950 to the present.

Claims/U.S. Patent Abstracts Weekly—includes the most current weekly updates and records from the current month; data is transferred to its companion database once a month.

Claims/Uniterm—covers more than 1.7 million records from IFI/Plenum Data Company, giving access to chemical and chemically related patents from 1950 to the present.

Inpadoc/Family and Legal Status—is a listing of new patents issued in 55 countries and patenting organizations.

Trademarkscan-Federal—contains records of over 800,000 currently active Federal Trademark applications and registrations, covering all active applications and trademarks registered in the U.S. Patent and Trademark Office (USPTO).

Trademarkscan—State—contains information on trademarks registered with the Secretaries of State of all 50 U.S. states and Puerto Rico.

World Patents Index—contains data from more than 5 million patent documents from 30 patent-issuing authorities around the world, giving details of nearly 3 million inventions. In addition to bibliographic information, the basic patent record includes the full abstract (for new products issued after 1981), informative title, International Patent Classification codes, and Derwent subject codes. This database also provides access to equivalent patents grouped together by patent family in the basic patent record.

World Patents Index Latest—covers patents from 1981 to the present. It contains files with data from nearly 3 million inventions, represented in more than 6 million patent documents, from 30 patent issuing authorities around the world.

Popular Information

Consumer Drug Information Fulltext—provides complete text of *Consumer Drug Digest*, with data on 260+ generic prescription drugs and some nonprescription drugs.

Consumer Reports—is the complete text of the 11 regular monthly issues of the printed *Consumer Reports* from 1982.

Magazine ASAP—provides the complete text and indexing for over 100 publications selected from approximately 400 publications covered in *Magazine Index.*

Magazine Index—covers more than 2.7 million citations from Information Access Co., containing references from 1959 to March 1970 and 1973 to the present for over 435 popular magazines.

Magill's Survey of Cinema—accesses articles on nearly 2,000 notable films and brief entries for nearly 20,000 others covering casts, awards, reviews, release date, and critiques.

Reference

Academic American Encyclopedia—is a full-text encyclopedia that includes approximately 30,000 articles written by more than 2,300 contributors who are experts in their fields.

American Library Directory—contains information on public, academic, special, and government libraries, and library personnel, facilities, and programs.

American Men and Women of Science—is a biographical registry of eminent, active American and Canadian scientists.

Biography Master Index—serves as a master index to biographical information found in more than 600 source publications, including English-language general and geographical directories, major biographical dictionaries, and handbooks of authors.

Career Placement Registry—contains resumes for over 25,000 people seeking employment. Experienced job seekers are included in the file as well as students seeking first-time employment. Resumes remain active for six months.

Database of Databases—is a directory of publicly available on-line databases.

Encyclopedia of Associations—comprises more than 21,000 records corresponding to the printed publication of the same name.

Everyman's Encyclopedia—contains detailed articles which cover virtually every subject area. It corresponds to the printed version of *Everyman's Encyclopedia*, including the 12 volumes of the 6th edition.

Expertnet—contains biographic profiles for over one thousand medical experts, each of whom have signed an agreement with ExpertNet Ltd. indicating a willingness to participate in medicolegal consultation. The database includes over 1,000 records and is updated 5 to 6 times a year.

Foundation Directory—comprises more than 5,000 current-year listings from The Foundation Center, describing foundations with assets of at least $1 million or that make grants of at least $100,000 annually.

Foundation Grants Index—accesses more than 355,000 records from The Foundation Center, containing information on grants awarded by more than 400 major American philanthropic foundations.

Gradline—covers all accredited institutions in the U.S. and Canada offering postbaccalaureate degrees.

Grants—contains more than 13,500 records from Oryx Press containing information on available grant programs.

Marquis Who's Who—contains biographies on over 101,000 top professionals in business, sports, government, the arts, and science.

National Foundations—comprises more than 25,500 records from The Foundation Center, containing records of all 22,100 U.S. foundations that award grants, regardless of the assets of the foundation or the total amount of grants it awards annually.

Peterson's College Database—lists and briefly describes the colleges and universities with two- and four-year degree programs in the United States.

Publishers, Distributors, and Wholesalers—contains complete address information for more than 21,000 publishers mentioned in *Books in Print*, 15,000 associations, 400 audiocassette publishers, 7,000 software producers, 500 microcomputer hardware manufacturers, 1,000 microcomputer peripheral manufacturers, 2,500 distributors, and 1,500 wholesalers.

Ulrich's International Periodicals Directory—contains references to more than 146,000 regularly and irregularly issued serials from 65,000 publishers in 181 countries.

Science and Technology

Aerospace Database—summarizes key scientific and technical documents on all aspects of aerospace research and development in more than 40 countries.

Ceramic Abstracts—covers ceramics and their use in abrasives, cements, and heat engine parts, as dielectrics in capacitors, and as the familiar clay and glass products.

Compendex—contains synopses of worldwide engineering publications and articles including the entire engineering field and its specialties.

Current Technology Index—is an index to current periodicals from all fields of modern technology. All journals indexed are published in the United Kingdom.

DMS Contract Awards—contains detailed information for all government contracts awarded. Coverage includes all contracting actions in excess of $25,000 for research, systems, and services in defense, aerospace, energy, and transportation markets.

DMS Contractors—identifies the companies involved in the U.S. and international defense/aerospace programs covered by the *DMS Market Intelligence Reports* services.

DMS Market Intelligence Reports—provides full text data and analysis for the aerospace and defense industries.

Engineered Materials Abstracts—covers the world's published literature in the science of polymers, ceramics, and composite materials intended for use in the design, construction and operation of structures, equipment, and systems.

Federal Research in Progress—provides access to information about ongoing, federally funded research projects in the fields of physical sciences, engineering, and life sciences.

FLUIDEX (formerly BHRA Fluid Engineering)—contains more than 201,000 records from the British Hydromechanics Research Association, indexing and abstracting worldwide information on all aspects of fluid engineering, theoretical research, and the latest technologies and applications.

Geoarchive—contains more than 605,000 citations, indexing more than 100,000 geoscience references each year from 1969 to the present.

Geobase—covers the worldwide literature of geography, geology, ecology, and their related disciplines.

Georef—provides access to more than 4,500 international journals, books, conference papers, government publications, dissertations, theses, and maps concerned with all aspects of geology, geochemistry, geophysics, minerology, paleontology, petrology, and seismology.

IHS Standards and Specifications—contains references to industry standards and military and federal specifications and standards covering all types of engineering and related disciplines.

Inspec—accesses more than 3.2 million citations from the Institution of Electrical Engineers, covering Science Abstracts from 1969 to the present.

Ismec—comprises more than 208,000 citations from Cambridge Scientific Abstracts, indexing significant articles from 250 journals covering mechanical engineering, production engineering, and engineering management.

Jane's Defense & Aerospace News/Analysis—provides articles that summarize, highlight, and interpret worldwide events in the defense and aerospace industry. The file contains about 58,000 records, and is updated weekly.

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Materials Business File—includes technical and commercial developments in iron and steel, nonferrous metals, composites, and plastics.

Mathsci—reviews and summarizes publications in pure mathematics, applied mathematics, and related fields.

Metadex (Metals Abstracts/Alloys Index)—from the American Society for Metals, contains more than 742,000 records covering international literature on the science and practice of metallurgy; abstracts are from 1,100 primary journal sources each year.

Meteorological and Geoastrophysical Abstracts—provides current citations in English for the most important meteorological and geoastrophysical research published in worldwide literature sources.

Non Ferrous Metals Abstracts—contains more than 112,000 records, covering all aspects of nonferrous metallurgy and technology from 1961 to 1983.

NTIS—comprises more than 1.3 million citations from National Technical Information Service, U.S. Department of Commerce, showing government-sponsored research, development, and engineering. Information covers the period from 1964 to the present.

Packaging Science and Technology Abstracts—provides access to research and development literature in all types of packaging science, including materials, equipment, packs, transport, storage, and testing. The database contains over 20,000 records and is updated monthly.

PASCAL—is a multidisciplinary database equivalent to the 79 printed *Pascal* journals. Literature from international sources is indexed and abstracted. Sources include journals, doctoral and masters theses, reports, conference proceedings, and books.

PTS Aerospace/Defense Markets & Technology—abstracts and indexes more than 100 key defense journals, and selectively abstracts defense-related articles from more than 1,500 additional business and trade journals, newspapers, and government reports.

SCISEARCH—contains more than 10.7 million citations, covering a multidisciplinary index to the literature of science and technology. Data covers 1974 to the present.

Soviet Science and Technology (SST)—provides scientific and technical information from Soviet Bloc countries including areas in chemistry, meteorology, fuels, and petroleum products, environmental sciences, electronics, metallurgy, engineering, agriculture, and space research.

SPIN (Searchable Physics Information Notices)—produced by the American Institute of Physics, offers more than 374,000 citations, indexing and abstracting selected world physics journals.

SSIE Current Research—contains more than 439,000 citations from Smithsonian Science Information Exchange, containing reports of government and privately funded scientific research projects in progress, initiated, or completed between 1978 and 1982.

Standards & Specifications—provides access to all government and industry standards, specifications, and related documents which specify terminology, performance testing, safety, materials, products, or other requirements and characteristics of interest to a particular technology or industry. The file contains data dating from 1950 to the present and is updated monthly.

Supertech—provides 56,000 records related to the fields of genetic engineering and biotechnology.

Textile Technology Digest—provides international coverage of the literature of textiles and related subjects.

TRIS (Transportation Research Information Service)—from the U.S. Department of Transportation and the Transportation Research Board, provides more than 273,000 records on transportation research information in air, highway, rail, and maritime transports, mass transit, and other transportation modes. Data covers 1968 to present.

World Aluminum Abstracts—contains more than 13,000 citations from the American Society for Metals, covering the world's technical literature on aluminum from 1968 to the present.

World Textiles—comprises more than 156,500 records from the Shirley Institute, a machine-readable version of World Textile Abstracts, covering world literature on the science and technology of textile and related material, and other aspects of the textile industry.

Social Sciences and Humanities

AIM/ARM—contains specialized index material for vocational and technical education research, work force development and economics, employment, job training, and vocational guidance.

A-V Online (formerly NICEM)—accesses more than 324,500 records from the National Information Center for Educational Media, covering nonprint educational material.

America: History & Life—comprises more than 241,500 records from ABC-Clio, Inc., covering the full range of U.S. and Canadian history, area studies, and current affairs.

The Architecture Database—indexes worldwide periodical literature and books of interest to architects, researchers, art and architectural historians, and engineers.

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Artbibliographies Modern—contains more than 107,000 records from ABC-Clio, Inc., containing references to all modern art and design literature.

Arts & Humanities Search—is an international, multidisciplinary database that corresponds to the *Arts & Humanities Citation Index*. Information dates back to 1980, and it is updated every two weeks.

Bible (King James Version)—is the complete text of the modern-day revision of the 1769 edition (by Thomas Nelson Publishers).

British Education Index—is the equivalent of the printed *British Education Index* and the microfiche *British Education Theses Index*. It covers all aspects of education from preschool to adult and higher education.

Child Abuse and Neglect—references more than 17,000 citations from the National Center for Child Abuse and Neglect, covering 1965 to the present. Data includes ongoing research project descriptions, bibliographic references, and service program listings.

Conference Papers Index—contains more than 1.3 million records covering more than 100,000 scientific and technical papers presented at over 1,000 major regional, national, and international meetings each year since 1973.

Current Contents Search—is the on-line version of the Institute for Scientific Information's *Current Contents* series of publications. Information is from January 1988 to the present, and is updated weekly.

D&B—Dun's Electronic Directory of Education—contains directory information on over 100,000 U.S. schools; 15,000 school districts; 3,000 colleges and universities; and 15,000 public libraries.

DIALOG Bluesheets—accesses records representing the bluesheet documentation issued for all databases on the DIALOG Information Retrieval Service. Information is reloaded weekly.

Dissertation Abstracts Online—contains more than 989,000 citations showing subject, title, and author for virtually every American dissertation accepted at an accredited institution since 1861.

ERIC—comprises more than 661,000 citations from Educational Resources Information Center, covering research in education.

Exceptional Child Education Resources—contains more than 68,500 citations covering published and unpublished literature on the education of handicapped and gifted children.

Family Resources—provides bibliographic and biographic coverage of the psychosocial literature related to the family.

Historical Abstracts—contains more than 298,000 citations from ABC-Clio, Inc., abstracting and indexing world periodical literature in history and related social sciences and humanities.

Information Science Abstracts—covers the literature on information science and related areas, including indexes and abstracts for journal articles, patents, proceedings, monographs, government documents and reports, series, and other publications.

Linguistics and Language Behavior Abstracts (LLBA)—contains more than 107,000 records containing language and language behavior abstracts from 1,000 domestic and foreign journals.

Lisa (Library and Information Science Abstracts)—references more than 80,200 records from Library Association Publishing Ltd., containing library and information science abstracts from more than 300 journals relating to all phases of librarianship and library services.

MLA Bibliography—accesses more than 1 million records from the Modern Language Association, covering 1976 to 1978. It indexes books and journal articles published on modern languages, literature, and linguistics.

Philosopher's Index—contains more than 143,500 citations from the Philosophy Documentation Center, indexing and abstracts books and 270 journals of philosophy and related fields.

Population Bibliography—references more than 67,800 records covering data from monographs, journals, technical reports, government documents, conference proceedings, dissertations, and unpublished reports on population. Data is available covering 1966 to 1984.

PsycALERT—provides full bibliographic information and brief indexing for all material subsequently included in *PsycINFO*.

PsycINFO—contains more than 640,000 citations from the American Psychological Association, covering world literature in psychology and related disciplines in the behavioral sciences.

Religion Index—indexes and abstracts articles from over 200 journals, and indexing for over 300 multiauthor works. The journal literature covers church history, biblical literature, theology, history of religions, and sociology and psychology of religion as well as related areas in the humanities, social sciences, and current events.

Art Literature International (RILA)—covers worldwide literature on Western art including publications on periodical articles, conference proceedings, Festschriften, collected essays, exhibition catalogs, museum publications, and doctoral dissertations.

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RILM Abstracts—contains more than 88,000 records from the International RILM Center of the City University of New York, containing abstracts of all significant literature on music from 1971 to the present.

Social SCISEARCH—accesses more than 2.4 million records containing multidisciplinary indexing for every significant item from the most important social sciences journals and other sources worldwide.

Sociological Abstracts—references more than 270,000 citations covering world literature in sociology and related disciplines from 1963 to the present.

United States Political Science Documents (USPSD)—comprises more than 39,500 records from the NASA Industrial Applications Center of the University of Pittsburgh, providing indexes and abstracts from 150 major American journals covering political science.

OTHER SERVICES

ONTAP Files

DIALOG allows users to familiarize themselves with searching its databases through its ONTAP databases. They contain only a fraction of complete files, but are available at only $15 per connect hour. The files include:

- ONTAP ABI/Inform
- ONTAP Aerospace
- ONTAP Agricola
- ONTAP Analytical Abstracts
- ONTAP Art Literature International (RILA)
- ONTAP Arts & Humanities Search
- ONTAP Biosis Previews
- ONTAP CA Search
- ONTAP CAB Abstracts
- ONTAP Chemname
- ONTAP Claims
- ONTAP Compendex Plus
- ONTAP D&B-Dun's Market Identifiers
- ONTAP DMS Contract Awards
- ONTAP Dialindex
- ONTAP Embase
- ONTAP Eric
- ONTAP Food Science and Technology Abstracts
- ONTAP Inspec
- ONTAP Investext
- ONTAP Kirk-Othmer Online
- ONTAP Magazine Index
- ONTAP Medline
- ONTAP NTIS
- ONTAP Psycinfo
- ONTAP PTS Marketing & Reference Service (MARS)
- ONTAP PTS Promt
- ONTAP SciSearch
- ONTAP Social SciSearch
- ONTAP Tax Notes Today
- ONTAP Trademarkscan-Federal
- ONTAP World Patents Index

Training Options

DIALOG offers current and prospective customers a free seminar called DIALOG Previews, which includes an introduction to DIALOG, and a customer clinic.

The introduction to DIALOG is a two-hour session, which includes a description of DIALOG's services and features, a live demonstration, and a question-and-answer session. The customer clinic is open to current DIALOG customers needing help with searching techniques or consultation on specific areas.

Customer clinic consultations are available by reservation only, and are limited to three sessions per DIALOG Previews Day. Each session is limited to one organization or institution, represented by up to three people from the organization.

DIALOG also offers an extensive training program through its system seminars. The system seminars are offered frequently at worldwide locations; as a convenience to its customers, DIALOG will provide a system seminar at a customer's location for groups of up to 12 staff members.

To facilitate ordering the full text of documents from their databases, DIALOG offers the *DIALORDER* service, which requires entering only the citations' entry numbers. Once the entry numbers are keyed in, the order is automatically transmitted, on-line, to the document supplier of choice.

The DIALORDER rapid ordering system is available for all of the DIALOG bibliographic databases and more than 150 million citations. More than 70 suppliers, other than DIALOG, offer documents through the DIALORDER service; suppliers include database producers, government agencies, and commercial document suppliers.

Chronolog, DIALOG's monthly newsletter, gives information on new DIALOG databases and new system features, and often presents helpful search hints.

Searching DIALOG: The Complete Guide is a basic reference manual documenting the DIALOG system. It describes DIALOG's features and commands, logon protocols, and search preparation. Separate chapters describe DIALOG databases. Another section describes each command used on the system, and includes more than 150 examples of searches. The publication costs $80 in North America and $150 elsewhere.

The *DIALOG Database Chapter* series contains Database Documentation Chapters. Separate chapters, expanding on the information in the Guide to DIALOG Searching, give

▷

▷ detailed, field-by-field descriptions of many of the DIALOG databases. The price is $6 for the database chapters in North America.

The *Database Catalog* briefly describes each database, including dates, size, and price data.

The *DIALOG Pocket Guide* summarizes the DIALOG search commands, system messages, and troubleshooting tips.

Individual database producers offer such documents as Database Thesauri, Subject Classification Lists, Journal Listings, Search Guides, etc.

Knowledge Index

DIALOG offers an after-hours, reduced-rate service for at-home use, *Knowledge Index.* This service provides access to more than 75 of DIALOG's databases, covering such topics as engineering, electronics, law, medicine, agriculture, psychology, business, education, and news. The Knowledge Index service is available from 6 p.m. to 5 a.m. (subscriber's time), Monday through Friday; 8 a.m. to midnight on Saturday; and 3 p.m. Sunday to 5 a.m. on Monday.

FUTURE PLANS

DIALOG is concentrating on developing personal computer software and image technology, and its electronic mail service—DIALMAIL. The company will continue to add databases, especially full-text files, concentrating on its strengths, including science technology, business, medical, and patent information, and increase its CD-ROM offerings and full text of newspapers. ☐

Dow Jones Information Services Group

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Synopsis

Editor's Note

Dow Jones Information Services Group is an operating unit of Dow Jones, publisher of *The Wall Street Journal*, *Barron's*, domestic and international newswires, and the Ottaway group of newspapers. Its premier on-line service is Dow Jones News/Retrieval. Launched in 1974, News/Retrieval offers exclusive on-line access to *The Wall Street Journal*, *Barron's*, and all the Dow Jones wires, including the Dow Jones News Service. Other electronically delivered services considered part of the Information Services Group are DowVision, a service that feeds information directly to corporate information systems, and the DowPhone audiotex service. Dow Jones also owns Telerate, a supplier of realtime financial information, which it purchased in 1989.

Dow Jones News/Retrieval is the most important and most complete on-line service for the business community. While most people access News/Retrieval for its business-related offerings, it also offers general news, weather, and sports reports. In addition, Dow Jones News/Retrieval offers software products to aid in downloading and manipulating data from its files.

Report Highlights

This report covers the services offered by the Dow Jones Information Services Group, an umbrella term for Dow Jones' electronically transmitted services, including Dow Jones News/Retrieval, DowVision, DowPhone, and Dow Jones News Services. It emphasizes Dow Jones News/Retrieval, its most popular and dynamic on-line service. It describes all the News/Retrieval databases and gives complete pricing information. The report also covers in detail DowVision, a new service that feeds news directly to corporate computer systems.

Vendor

Dow Jones Information Services Group
P.O. Box 300
Princeton, NJ 08543-0330
(800) 225-3170

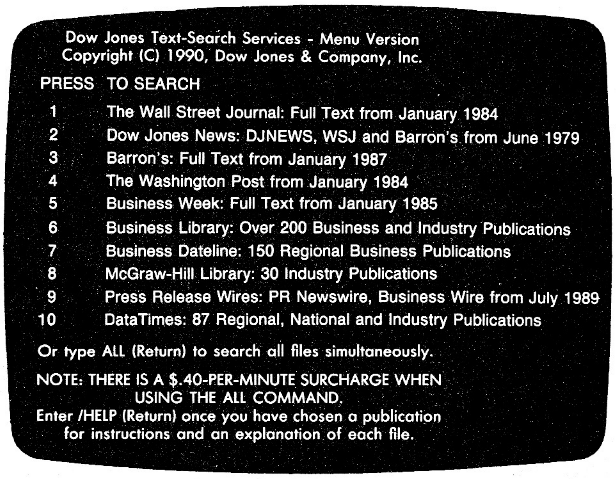
Analysis

Dow Jones Information Services Group offers an array of electronic information services that are in keeping with the fine reputation that Dow Jones enjoys as a business publisher. Dow Jones News/Retrieval, for example, is as important to business users of on-line information as *The Wall Street Journal* is to the business community at large.

News/Retrieval's main strengths are in securities and in-depth business, news, and financial information, and its most popular databases are ***The Wall Street Journal*** and ***Dow Jones News***. These databases are exclusive to News/Retrieval. Other important files include the ***Washington Post***, ***Business Week***, and ***Business Dateline*** and the "Business Library," which consists of articles from ***Forbes***, ***Fortune***, ***American Demographics***, ***Money***, ***PR Newswire***, and regional newspapers from DataTimes.

Dow Jones News/Retrieval and DataTimes, one of two companies specializing in providing access to regional newspapers (the other is Knight-Ridder's VU/TEXT), recently combined their computer resources. This means that subscribers of either service can search the other's service using the same commands. Also, users can search across all 500 domestic and international newspapers, magazines, trade journals, and wire services that the two companies offer combined.

Figure 1.
News/Retrieval



```
    Dow Jones Text-Search Services - Menu Version
    Copyright (C) 1990, Dow Jones & Company, Inc.
 PRESS  TO SEARCH
   1      The Wall Street Journal: Full Text from January 1984
   2      Dow Jones News: DJNEWS, WSJ and Barron's from June 1979
   3      Barron's: Full Text from January 1987
   4      The Washington Post from January 1984
   5      Business Week: Full Text from January 1985
   6      Business Library: Over 200 Business and Industry Publications
   7      Business Dateline: 150 Regional Business Publications
   8      McGraw-Hill Library: 30 Industry Publications
   9      Press Release Wires: PR Newswire, Business Wire from July 1989
  10      DataTimes: 87 Regional, National and Industry Publications
 Or type ALL (Return) to search all files simultaneously.
 NOTE: THERE IS A $.40-PER-MINUTE SURCHARGE WHEN
              USING THE ALL COMMAND.
 Enter /HELP (Return) once you have chosen a publication
    for instructions and an explanation of each file.
```

News/Retrieval offers an extensive selection of business publications on-line, as this menu shows.

Company Background

Dow Jones Information Services Group is an operating unit of Dow Jones & Company, Inc. Dow Jones was founded in 1882 and had 1989 revenues exceeding $1.6 billion. Dow Jones News/Retrieval (DJN/R) was launched in 1974 as a joint venture between Dow Jones and Company and Bunker Ramo Corporation. (Bunker Ramo was subsequently bought out.) News/Retrieval began as an on-line service for brokers and private investors. Over the years, however, News/Retrieval has successfully targeted the much larger market consisting of corporate on-line users. Today, News/Retrieval provides its subscribers with business, financial, and general news via numerous proprietary and nonproprietary databases.

Information sources include Dow Jones' own *The Wall Street Journal*, *Barron's National Business and Financial Weekly*, and the *Dow Jones News Service*, as well as Disclosure Incorporated's *Disclosure Online*, Zack's Investment Research Inc.'s *Zack's Corporate Earnings Estimator*, Business Research Corporation's *Investext*, and Fidelity Brokerage Services Inc.'s *Fidelity Investor's Express*. The service also features full-text articles from *Business Week* and other McGraw-Hill publications.

In 1989, Dow Jones purchased Telerate (one of the leading providers of financial instrument prices and related products). Telerate's product line fits in well with Dow Jones News/Retrieval's, and its association with News/Retrieval opens up a potential subscriber base that otherwise may not have been as accessible. In 1989 the company also acquired a 15 percent stake in DataTimes. News/Retrieval has also entered the Japanese market. Kyodo News Services, along with KDM Inc. (a Japanese electronic mail vendor), markets News/Retrieval in Japan. Also, speaking of Japan, in mid-1990 News/Retrieval upgraded its computer and communications facilities there, enabling Japanese users for the first time to access its service via a local phone call.

Other electronic information services include the DowPhone interactive telephone information service and the DowVision service for corporate users.

Competitive Position

In early 1990 *Fortune* magazine's annual survey of "corporate reputations" found, for the seventh straight year, that Dow Jones is the most admired company in its industry. The ranking takes into account, in part, the quality of each company's products and services. In the increasingly competitive financial and business information market, Dow Jones is doing all it can to stay ahead of the pack. Competitors such as DIALOG Information Services and CompuServe continue to add new business services and software interfaces of their own. While Dow Jones is also doing this (its recent agreement with DataTimes is an example), it is also doing much more. Simply put, Dow Jones is using a combination of advanced technology and visionary planning to spread its services to the vast, and still relatively untapped, end-user market.

Perhaps the best example of this strategy is DowVision. Introduced in 1990, DowVision provides customized information delivery to corporate customers. Another end-user-oriented service, DowQuest, enables searchers to tap Dow Jones News/Retrieval's databases without using commands, entering keywords, or employing any other of the usual tools for sifting through electronic data. Instead, through DowQuest, searchers can query a database the same way they would query a person: By asking it the question they want answered using "plain English." If services such as DowVision and DowQuest do not pay off for Dow Jones, it will not be for lack of trying.

Resources and Facilities

Dow Jones News/Retrieval's databases are maintained in a computerized databank at its Princeton, NJ headquarters.

Processing Centers

The Dow Jones computers are two IBM 4341 systems. Dow Jones also carries four Digital Equipment Corporation 1144 computers for corporate users.

Subscribers access data via dial-up communications facilities using their own terminals, word processors, or personal computers, with vendor-supplied software programs to aid inquiry and information retrieval.

Customer Support Services

Software supplied by vendors includes menu-driven inquiry and response routines supported by user reference guides containing the codes needed to access the databases. Dow Jones supplies a special training password that entitles each user to free access for a day. A customer service hot line is available 14 hours a day, Monday through Friday, and 8 hours on Saturday.

Dow Jones News/Retrieval is available 24 hours per day, 7 days per week. Prime-time hours are listed below. All other hours are non-prime time.

Dow Jones News/Retrieval's Hours of Operation

	Prime Time
Eastern Time	6 a.m.-6 p.m.
Central Time	5 a.m.-6 p.m.
Mountain Time	4 a.m.-6 p.m.
Pacific Time	3 a.m.-6 p.m.
Alaska & Hawaii	2 a.m.-6 p.m.

Weekends and Holidays are all non-prime time.
Observed Holidays are New Year's Day, President's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

Sales And Marketing Services

Dow Jones is a major publishing firm with printing plants and offices in the United States and Canada. News/Retrieval is marketed directly to users.

Processing Services

Some specifics regarding Dow Jones' pricing and information retrieval services follow.

Pricing

Dow Jones News/Retrieval is available under three plans. In addition to a standard subscription plan, Dow Jones offers a Blue Chip Membership plan, featuring a 33.3 percent savings for non-prime-time users. Dow Jones' Corporate Membership

Special Fees

Corporate Ownership Watch, Disclosure, Standard & Poor's, and Worldscope have a document charge of $9 per company search during prime time and $3 per company search during non-prime time (three Disclosure ownership files have additional document charges of $9 each during prime time and $3 each during non-prime time).

Dun's Financial Records PLUS has additional charges of $24 for each History and Operations Report, $42 for each Company Profile, $79 for each Financial Records Report or $96 for "ALL" (Company Profile plus Financial Records Report).

Fidelity Investor's EXPRESS has a monthly account fee of $12 but no per-minute charges for access.

Investext has an additional charge of $1.25 for each information unit transmitted at all baud rates. The 2400 baud information-unit charge does not apply. Blue-Chip and Corporate discounts do not apply to the Investment information unit charges.

MCI Mail has no per-minute charges for access. There is a $25 annual mailbox fee. Charges for sending a letter vary depending on the type of delivery.

QuickSearch "ALL" command is charged at a flat rate of $45 each time it is used and there are no per-minute or document charges. Free-time offers do not apply to the "ALL" command. Document charges apply to Disclosure, Standard & Poor's, and Corporate Ownership Watch; and information-unit charges apply to Investext when making individual QuickSearch selections.

plan features a 33.3 percent savings on *both* prime-time and non-prime-time usage. Start-up fees, initial free time offers, and annual charges under these plans are as follows:

Standard Membership

- $29.95 start-up fee per account
- $18 annual service fee (waived the first year)
- Three free hours on the service (to be used within 30 days)
- Standard connect-time charges apply
- User's Guide

Blue Chip Membership

- $29.95 onetime start-up fee per account
- $95 annual membership fee per account per location
- No annual service fee
- 33⅓ percent discount on standard nonprime per-minute charges

Corporate Membership

- $75 monthly membership fee per account per location
- 33⅓ percent discount on standard prime and non-prime-time per-minute charges
- 10 free hours (to be used within 30 days)
- No annual service fee
- User's Guide

Table 1 provides per-minute charges for use of Dow Jones News/Retrieval's databases and other on-line services. The accompanying sidebar details special fees associated with some of these databases/services. Blue Chip and Executive discounts apply to the total per-minute charge.

Application-Specific Services

Dow Jones provides several microcomputer financial software systems that allow users to access the Dow Jones News/Retrieval databases to obtain financial and investment information and to manipulate that data according to the user's requirements (see Microcomputer Software/Services).

Information Retrieval

Dow Jones News/Retrieval's databases relate to the securities industry, as well as to general news and consumer information. Most of these services are described in the On-Line Databases section.

Electronic Mail

MCI—News/Retrieval customers can take advantage of the MCI Mail electronic mail service to send electronic messages, files, and faxes from their personal computers. In addition, MCI Mail subscribers can access Dow Jones News/Retrieval's

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databases via a gateway arrangement. That is, "Dow Jones News/Retrieval" is a menu item off MCI Mail's main menu. Accessing a Dow Jones database or service then is as simple as selecting the appropriate number from the menu. The MCI Mail user is then ported over to the Dow Jones News/Retrieval service; once that happens, Dow Jones commands (rather than MCI Mail commands) must be used to navigate the service.

DowPhone Audiotext Services

DowPhone is a subscription-based telephone information service that is geared toward active investors. It provides realtime stock quotes, news reports, and investment analysis. With the use of a pushbutton phone (and a DowPhone passport number), subscribers can receive DowPhone's voice reports on over 6,500 publicly owned companies and 300 business and financial subjects. Also available are technical opinions on more than 4,000 publicly held companies, provided by Innovest Systems, Inc.

In November 1989, a spin-off product was introduced, *JournalPhone.* JournalPhone provides business and financial news updates through a "900" telephone number. Sources include *The Wall Street Journal* and Dow Jones News.

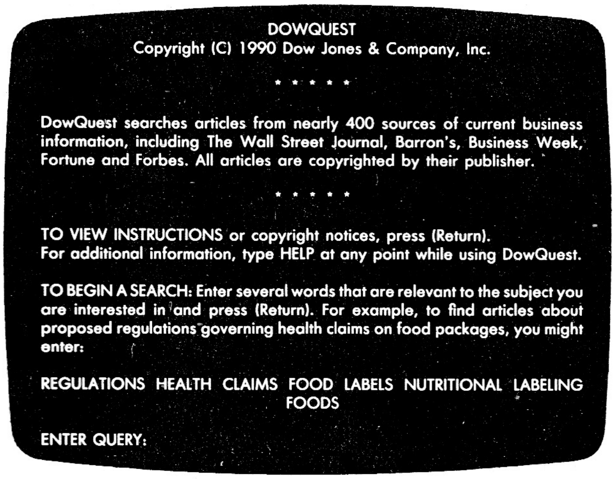
Industry-Specific Services

While a wide variety of businesses and individuals subscribe to News/Retrieval, its core services appeal primarily to the corporate market. News/Retrieval's 55 databases provide information vital to the operation of these organizations. This information includes the latest stock quotations, up-to-the-minute business news, market indexes, company financial statistics, money market data, and economic updates.

Microcomputer Software/Services

Dow Jones Market Analyzer PLUS—an investment software program that provides technical stock market analysis for both individual and professional investors. It provides bar, comparison, and relative strength charts and point and figure analysis and charting of standard volume indicators. Up to four charts can be displayed simultaneously, in split-screen format. The program enables users to generate technical analysis reports. Investors can review summary reports that display price changes, price and volume ratios, volatility, and Welles Wilder relative strength over user-specified time periods. The program runs on IBM PC/XT/AT and AT&T PC 6300 personal computers.

Figure 2.
DowQuest Menu



```
                         DOWQUEST
         Copyright (C) 1990 Dow Jones & Company, Inc.

                         * * * * *

DowQuest searches articles from nearly 400 sources of current business
information, including The Wall Street Journal, Barron's, Business Week,
Fortune and Forbes. All articles are copyrighted by their publisher.

                         * * * * *

TO VIEW INSTRUCTIONS or copyright notices, press (Return).
For additional information, type HELP at any point while using DowQuest.

TO BEGIN A SEARCH: Enter several words that are relevant to the subject you
are interested in and press (Return). For example, to find articles about
proposed regulations governing health claims on food packages, you might
enter:

REGULATIONS HEALTH CLAIMS FOOD LABELS NUTRITIONAL LABELING
                          FOODS

ENTER QUERY:
```

The main menu from News/Retrieval's new DowQuest service. Intended for end users, this service permits researchers to enter search terms in conversational English.

Dow Jones Market Manager Plus 2.0—allows the user to account for security transactions while providing printed reports for review and tax records. Market Manager Plus enables the user to determine tax liability by a preview of the results of matching sell transactions against different positions. It automatically dials and signs on to Dow Jones News/Retrieval and can request latest prices for up to 500 open tax lots and store them. The package also maintains accounting information for up to 26 different portfolios and will accept securities, stocks, bonds, options, mutual funds, and treasuries. In addition, Market Manager Plus accommodates buy, sell, short-sell, and buy-to-cover transactions and can generate nine reports: Holdings by Portfolio; Stock Long-term Alerts; Holdings by Security; Option Expiration Alerts; Realized Gain/Loss; Bond and Treasury Bill Maturity Alerts; Security and Cash Transaction; Interest Tax; and Dividend Tax. The Market Manager is currently available for the IBM PC XT, Apple II/IIe/IIc, and Apple Macintosh computers.

Market Manager Plus Professional Version—in addition to obtaining market data from Dow

Table 1. Access Charges (per-minute) for News/Retrieval Databases

		Prime-Time Charges				Non-Prime-Time Charges			
		Corporate		Standard/Blue Chip		Corporate/Blue Chip		Standard	
		300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud
//BUSINESS	Business and Finance Report								
//DJNEWS	Dow Jones News								
//KYODO	Japan Economic Daily								
//NEWS	News/Retrieval World Report	0.90	*1.93	1.35	*2.90	0.14	*0.30	0.21	0.45
//OAG	Official Airline Guide								
//RELEASE	Press Release Wires								
//TRACK	Tracking Service**								
//TRADELINE	Tradeline**								
//CANADA	Corporate Canada Online								
//CMR	Capital Markets Reports								
//DB	Dun's Financial Records PLUS**								
//DJINS	Dow Jones International News								
//DSCLO	Disclosure Online**								
//EPS	Zacks Corporate Earnings Estimator								
//FUNDS	Mutual Funds Performance Report								
//INNOVEST	Innovest Technical Analysis Reports								
//INVEST	Investext**	0.90	*1.93	1.35	*2.90	0.56	*1.20	0.84	*1.80
//MG	Media General Financial Services								
//MMS	MMS Weekly Market Analysis								
//PIR	Professional Investor's Report								
//QUICK	Dow Jones QuickSearch**								
//SP	Standard & Poor's Online**								
//TEXT	Text-Search Services, Command Version**								
//TEXTM	Text-Search Services, Menu Version**								

**2400 baud modem users will be charged an additional $0.36 in prime time and $0.09 in non-prime time for each* information unit *accessed. An* information unit *consists of 1,000 characters including spaces and return keys. Blue Chip and Corporate Membership discounts apply to both 2400 baud information unit and per-minute usage charges.*
***See "Table 3. Special Fees."*

Notes:
1. Brokers or dealers involved in the purchase or sale of negotiable financial instruments are subject to additional conditions.
2. If log-on is before 6:01 p.m. local time, prime-time charges are applicable for the entire session.
3. There is a one-minute minimum for each access of any billable service.
4. These prices, terms, and conditions are effective as of the above date, are subject to change, and do not include applicable federal, state, and local taxes. See //FYI, our free online newsletter, for the most current information.
5. Usage charges and other special fees may be tax deductible. Consult your tax advisor for further information.
6. Free hours issued upon customer start-up or through Dow Jones software purchases apply to U.S. and Canadian accounts only and must be used within 30 days after receipt of password. All Special Fees (see "Table 3. Special Fees") still apply and are excluded from all free-time offers.

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Table 1. Access Charges (per-minute) for News/Retrieval Databases (Continued)

		Prime-Time Charges				Non-Prime-Time Charges			
		Corporate		Standard/Blue Chip		Corporate/Blue Chip		Standard	
		300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud	300 Baud	1200 & 2400 Baud
//WATCH	Corporate Ownership Watch**								
//WORLD SCOPE	Worldscope**								
//DOWQUEST	DowQuest	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00
//BOOKS	Magill Book Reviews								
//CQE	Enhanced Current Quotes								
//DJA	Historical Dow Jones Averages								
//ENCYC	Academic American Encyclopedia								
//FUTURES	Futures Quotes								
//HQ	Historical Quotes								
//MENU	Master Menu								
//MOVIES	Cineman Movie Reviews	0.70	*1.46	1.05	*2.20	0.14	*0.30	0.21	*0.45
//RTQ	Real-Time Quotes**								
//SCHOOL	Peterson's College Selection Service								
//SPORTS	News/Retrieval Sports Report								
//STORE	Comp-u-store Online								
//SYMBOL	News/Retrieval Symbols Directory								
//WSW	Wall $treet Week Online								
//WTHR	News/Retrieval Weather Report								
//FIDELITY	Fidelity Investor's EXPRESS**	**	**	**	**	**	**	**	**
//MCI	MCI Mail**	**	**	**	**	**	**	**	**
//FYI	For Your Information	Free	Free	Free	Free	Free	Free	Free	Free

**2400 baud modem users will be charged an additional \$0.36 in prime time and \$0.09 in non-prime time for each* information unit *accessed. An* information unit *consists of 1,000 characters including spaces and return keys. Blue Chip and Corporate Membership discounts apply to both 2400 baud information unit and per-minute usage charges.*
***See "Table 3. Special Fees."*

Notes:
1. Brokers or dealers involved in the purchase or sale of negotiable financial instruments are subject to additional conditions.
2. If log-on is before 6:01 p.m. local time, prime-time charges are applicable for the entire session.
3. There is a one-minute minimum for each access of any billable service.
4. These prices, terms, and conditions are effective as of the above date, are subject to change, and do not include applicable federal, state, and local taxes. See //FYI, our free online newsletter, for the most current information.
5. Usage charges and other special fees may be tax deductible. Consult your tax advisor for further information.
6. Free hours issued upon customer start-up or through Dow Jones software purchases apply to U.S. and Canadian accounts only and must be used within 30 days after receipt of password. All Special Fees (see "Table 3. Special Fees") still apply and are excluded from all free-time offers.

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Jones News/Retrieval, this program performs all standard portfolio management functions. The program includes a flexible report writer that enables users to generate customized reports to meet personal or corporate requirements. The program also includes automatically timed pricing; expanded file sizes that handle 9,250 portfolios and 16,383 open positions; and client profile data for summarizing and searching by client goals, activity, and risk factors.

Dow Jones Spreadsheet Link—enables the user to download data from the *Current and Historical Quotes*, *Media General Financial Services*, and *Disclosure II* databases in spreadsheet format compatible with either VisiCalc, Multiplan, or Lotus 1-2-3. This software package is available for IBM PC and Apple microcomputer systems.

Desktop Express—a desktop communications software program that integrates electronic mail functions of MCI Mail with the advanced graphics capabilities of the Apple Macintosh series of personal computers.

Dow Jones Straight Talk 2.0—a communications package that provides easy access to Dow Jones News/Retrieval and other on-line services. In addition, Straight Talk electronically transfers future enhancements and database upgrades from News/Retrieval. This program is exclusively available on the Apple Macintosh personal computer system.

Compu Trac Link—a program that facilitates the use of current and historical security quotes from Dow Jones News/Retrieval. The program provides automatic logon to and updating of data from News/Retrieval at times specified by the user. In addition to retrieving data from Historical Quotes, Futures Quotes, and Current Quotes Enhanced, Compu Trac Link also accesses News/Retrieval's 40 other databases.

Networking Services

Access to Dow Jones News/Retrieval is available via Tymnet, SprintNet (formerly Telenet), and AT&T Information Systems communications networks and cable systems. Access is also available through DowNet, Dow Jones' own communications network. The Tymnet and SprintNet data networks are employed and paid for on an as-used basis. Access is available 24 hours a day, 7 days a week.

On-Line Databases

Dow Jones News/Retrieval offers subscribers up-to-the-minute news and information useful to the business and financial communities. Information is kept current in more than 55 on-line databases covering a wide variety of topics.

Dow Jones News/Retrieval also offers a free on-line newsletter, featuring new database announcements and other information of interest to subscribers. The On-line Databases section (Tab OL40) of this publication includes detailed descriptions of most of these databases.

News

The Business and Finance Report (//BUSINESS)	continuously updated business and financial news from *The Wall Street Journal*, *The Dow Jones News Service*, and other newswires.
Dow Jones Capital Markets Report and Financial Futures Report (//CMR)	newswire providing current, comprehensive coverage of fixed income and financial futures markets worldwide.
Dow Jones International News (//DJINS)	international business news from Dow Jones' international newswires, *The Wall Street Journal*, *The Wall Street Journal Europe*, and the *Asian Wall Street Journal*.
Dow Jones News (//DJNEWS)	contains news taken from *The Wall Street Journal*, *Barron's*, and the *Dow Jones News* wire service. Current (literally up to the minute) news stories are featured in the database, as are stories from as far back as 90 days.
Federal Filings (//FEDFILES)	realtime coverage of all M&A filings on 18,000 companies registered with the SEC. The database also includes filings relating to 1,700 major corporations.
Japan Economic Daily (//KYODO)	offers same-day coverage of major economic, political, and business news from Japan. Information is satellite fed to the United States at the end of Japan's business day. The service provides a review of the day's top news stories from Japan; a report on the Tokyo stock, bond, commodity, and currency markets; and general economic, business, and political news.
News/Retrieval World Report (//NEWS)	features foreign and national news; updated continuously throughout the day.

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News/Retrieval Sports Report (//SPORTS)	contains scores, statistics, standings, stories, and schedules for most major sports; updated continuously.
News/Retrieval Weather Report (//WTHR)	provides three-day Accu-Weather forecasts, updated twice daily, for more than 100 major cities.
Professional Investment Report (//PIR)	exclusive coverage of unusual trading activity (15-minute delay) for over 5,000 stocks traded on the New York and American exchanges as well as on the OTC National Market System.

The Reference Library

Dow Jones Text-Search Services (//TEXT, //TEXTM)	provides the full text of thousands of news articles collected in a library of 200 of the nation's most respected business publications. Available in a menu-driven or command-driven format.
The Wall Street Journal	includes exclusive access to all stories that appeared or were scheduled to appear in *The Wall Street Journal* since January 1984.
Dow Jones News	includes broadtape and selected stories from *Barron's* and *The Wall Street Journal* since June 1979.
Barron's	full text of articles in *Barron's* since January 1987.
The Washington Post: Full Text Version	includes the full text of selected articles that appeared in the *Washington Post* since January 1984.
The Business Library	selected articles from *Forbes*, *Fortune*, *Money*, *Financial World*, and *American Demographics* and the full text of the *PR Newswire* since January 1985.
Business Dateline	full text of selected articles from more than 150 regional business journals since January 1985.
DataTimes	an on-line service that provides the full text of articles from 87 publications, including many regional newspapers, two Associated Press wires, *The Congressional Quarterly*, *American Banker*, Gannett News Service, and *USA Today*. In July 1990, Dow Jones and DataTimes signed an agreement to combine their electronic database resources. Therefore, customers of either service now have access to the other service, via the *same* commands. In addition, the two companies' combined sources (totaling more than 500 domestic and international newspapers, magazines, trade journals, and wires services) can be searched simultaneouly.

Company and Industry Statistics and Forecasts

Corporate Canada Online (//CANADA)	Canadian business news and financial and market information on more than 2,200 public, private, and Crown Canadian companies from Canadian publisher Info Globe.
Dun's Financial Records PLUS (//DB)	comprehensive financial, historical, and operational information on more than 1.5 million public and private companies.
Disclosure Online (//DSCLO)	Disclosure Inc.'s weekly updated database of corporate financial information on file with the U.S. Securities and Exchange Commission (SEC). It covers more than 12,000 publicly owned firms. Information is obtained from 10Ks, 20Fs, 10Qs, 8Ks, Proxy, and Registration statements. Company profiles, balance sheets, income statements, five-year sales figures, income and earnings trends, and documents filed with the SEC are all included.
Zack's Corporate Earnings Estimator (EPS)	contains a consensus of corporate earnings compiled by Zack's Investment Research, Inc. Information on 4,800 of the most widely followed companies is provided by top analysts at more than 50 major stock brokerage firms. Data is for the current and previous week, month, and 26-week period.
Innovest Technical Analysis Reports (//INNOVEST)	technical opinions based on computer analyses of more than 4,500 stocks traded on New York and American exchanges and over the counter.

Corporate Ownership Watch (//WATCH)	summaries of 5 percent ownership and names of all tender file offers. Insider trading information on more than 8,000 publicly held companies. The database reports on trades made by nearly 80,000 individuals (corporate directors, officers, or shareholders with more than 10 percent ownership).
Investext (//INVEST)	provides full text of more than 20,000 research reports on more than 5,000 U.S. and Canadian companies and 53 industries.
Media General Financial Services (//MG)	Media General, Inc.'s weekly updated database, with financial data on approximately 5,400 companies listed on the New York and American Stock Exchanges. Earnings, revenue, dividends, price/earnings ratios, shareholdings, and stock performance are also included, as is composite information on 180 industries.
MMS Weekly Market Analysis (//MMS)	a weekly survey of U.S. money market and foreign exchange trends. The database provides median forecasts of monetary and economic indicators. It also provides weekly analyses of debt, currency, and equity markets.
Standard & Poor's Online (//SP)	provides concise profiles of 4,700 companies including earnings, dividends, and market figures for the past four years. The database also provides corporate overviews plus S&P earnings estimates for most major companies.
Worldscope (//Worldscope)	comprehensive information on more than 4,500 corporations in 25 countries. Review three to four years of corporate profiles, operating summaries, balance sheets, income statements, sources and uses of funds, growth rates, financial ratios, stock data, accounting practices, and international business activity.

Custom Profiles and Reports

Dow Jones QuickSearch (//QUICK)	provides a corporate report that is drawn from multiple News/Retrieval services, obtainable with one command.
Dow Jones Tracking Service (//TRACK)	enables users to create and track up to five profiles containing as many as 125 companies each. Users can automatically track current quotes (minimum 15-minute delay) and the latest news stories and headlines on the companies in the profiles chosen.

Quotes and Market Averages

Enhanced Current Quotes (CQE)	provides current stock quotes (minimum 15-minute delay during market hours), with an exclusive news alert when a story about a company breaks on the News Service. Current quotes are also available for bonds, mutual funds, U.S. Treasury Issues, and options.
Real Time Quotes (//RTQ)	provides stock prices with no delay from the major exchanges, including composites. This database also features a news alert.
Tradeline (//TRADELINE)	up to 15 years of historical information on stocks, bonds, mutual funds, and indexes for approximately 150,000 issues.
Historical Quotes (//HQ)	provides daily volumes (high, low, and close) for a full year. The database also contains monthly summaries back to 1979 and quarterly summaries back to 1978.
Dow Jones Futures Quotes (//FUTURES)	provides current quotes (10- to 30-minute delay) for more than 80 commodities from the major North American Exchanges; updated throughout market hours. The database also provides daily open, high, low, last, and settlement prices; daily volume and open interest; and lifetime high and low.
Historical Dow Jones Averages (//DJA)	available for industrials, transportation, utilities, and 65 stock composites. The database provides daily historical quotes accessible by specific date; composites for monthly and quarterly requests are available.
Fidelity Investors Express (//FIDELITY)	allows users to place trades on-line for listed securities. Customers can also review current orders; access stock and option quotations; and check current balances, positions, and trading limits.
Mutual Funds Performance Report (//FUNDS)	historical performance, assets, and background information on approximately 1,500 mutual funds.

Business Services

Official Airline Guide (OAG)	provides airline schedule information and fares for more than 600 major carriers worldwide. Enables users to book their own reservations.

Wall $treet Week (//WSW)	provides transcripts of the Public Broadcasting System's "Wall $treet Week" television program. Subscribers can retrieve commentary from shows, research specific subject matter, and receive expert advice on selected topics.

General Services

Comp-U-Store (//STORE)	an electronic shopping service featuring more than 250,000 discounted brand name products, ranging from appliances to sporting goods.
Academic American Encyclopedia (//ENCYC)	contains more than 32,000 articles covering industry and finance, and academic subject areas. The database is updated quarterly.
Peterson's College Selection Service (//SCHOOL)	covers more than 3,000 two- and four-year colleges and universities. Profiled by size, entrance difficulty, location, cost, financial aid, majors, and admissions requirements. Enables users to locate schools through a selection search that meets their individual requirements and to search by college name.
Cineman Movie Reviews (//MOVIES)	provides reviews of thousands of movies dating back to 1926, as well as of the latest releases.
Magill Book Reviews (//BOOKS)	reviews of recent fiction and nonfiction updated weekly.

On-Line Reference Tools

For Your Information (//FYI)	News/Retrieval's free on-line newsletter. The database provides announcements of new databases and other information of interest to subscribers.
Master Menu (//MENU)	a complete on-line listing of the information contained in the service, along with detailed instructions on how to access each database.
News/Retrieval Symbols Directory (//SYMBOL)	provides a comprehensive on-line listing of the stock symbols and codes used to access News/Retrieval services. Includes stocks, corporate and foreign bonds, Treasury Issues, mutual funds, options, category codes, media, general industry groups, and recent symbol changes.
Words of Wall Street (//DEFINE)	offers definitions of more than 2,000 business and financial terms used by professional investors.

Other Services

Dow Jones Information Services Group offers several innovative services geared to inexperienced, nonprofessional searchers.

DowQuest

Dow Jones News/Retrieval's DowQuest service, introduced in 1989, is a menu-driven service that lets users search through 175 business publications using natural-language queries. The user states the subject of interest in plain, conversational English. DowQuest then delivers a starter set of headlines. From these, the user chooses those that seem on the mark. The system then uses this information as the basis of a second, more focused search. Users enter the DowQuest service by typing //QUEST.

DowVision

In 1990, after considerable development (in terms of money and time), Dow Jones launched an innovative information service that may do much to bring managers and other corporate executives online. ***DowVision*** delivers customized business news and information through corporate computer systems directly to desktops. It currently includes the five Dow Jones-proprietary newswires—the Dow Jones News Service (the "Broadtape"), the Capital Markets Report, The Professional Investor Report, Dow Jones International News Services, and Federal Filings, plus two outside wires—PR Newswire and Business Wire. The company is planning to add an interactive component to the service (News/Retrieval) by the end of 1990. DowVision enables users to receive information that interests them without dialing out via modem, at a flat, predictable price.

Dow Jones has allied with outside software developers, which have developed supporting software products for DowVision. These developers build custom products that use DowVision's news sources to meet customer needs. These products will ensure that DowVision is compatible with as many corporate computer systems as possible.

Future Plans

Dow Jones reports that its goal is to answer customer needs; new services such as Dow Vision are enabling it to do just that. ■

European Space Agency-Information Retrieval Service (ESA-IRS)

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Synopsis

Editor's Note

This report concentrates on ESA-IRS, the European Space Agency's Information Retrieval Service. This government-sponsored agency provides access to more than 130 scientific and technical bibliographic databases. This updated report discusses ESA's new pricing structure. Introduced in January 1989, it has proved to be very profitable, not only for ESA-IRS but for the on-line industry. This report also contains an updated and complete listing of ESA-IRS database files that were effective since January 1989, and provides a list of the database producers. This report also contains information on ESA's pricing strategy and the advantages of searching on-line with ESA-IRS.

Report Highlights

ESA-IRS is implementing a new pricing policy designed to change for the information a user accesses. It not only eliminates the connect time charges, but also gives the user new and valuable methods for performing better and more relevant searches. This new pricing policy means that the user pays principally for the document references he extracts. This report explains the housekeeping charge, how the access charges are calculated using accounting units, how to evaluate on-line information, how to obtain source data, how searches are output, how searches are downloaded, and also what kind of rebates are available during a particular calendar month. We also discuss the advantages of ESA's new strategy such as how the stress of "being against the accounting clock" is taken out of searching, how to make the technology work best, how to improve search quality and relevance, and the efficiency of these searches in order to save company time.

Vendor

European Space Agency-
Information Retrieval Service (ESA-IRS) ℅ Information Services Associates (ISA)
Los Altos, California 94022
(415) 948-2326

Analysis

ESA-IRS, the Information Retrieval Service of the European Space Agency, provides access to more than 130 scientific and technical databases, most of which are bibliographic. In fact, the government-sponsored agency provides one of the largest selections of databases available in Europe. ESA-IRS also offers an asynchronous communications package, Mikrotel, that automates access and search procedures on ESA-IRS. In addition, the agency offers subscribers such value-added services as an electronic mailbox, automatic crossfile searching, and self-training courses.

Company Background

Established in 1966, ESA-IRS was developed to meet the needs of the European Space Agency, which provides for and promotes cooperation among European states in space research and technology. It has nine national centers. ESA-IRS is represented in the United States by Information Services Associates (ISA), Los Altos, California 94022; telephone (415) 948-2326.

ESA-IRS, one of the top European on-line database vendors, offers access to over 130 databases, including a bilateral gateway to Pergamon Financial Services. (Databases from Pergamon Financial Services are unavailable through this gateway in North America.) ESA-IRS' databases are mainly scientific and/or technical and are generally bibliographic. Some of the databases are unique to ESA-IRS. In addition, business-related databases have recently been added, mainly through gateway arrangements with PROFILE and Pergamon Financial Services, both in the U.K.

The agency also provides the *Mikrotel* telecommunications software package, which provides automated logon and search capabilities on ESA-IRS. In addition, ESA-IRS offers user training seminars, on-line self-training courses, and the *News and Views* newsletter, as well as documentation updates to keep subscribers current.

Competitive Position

ESA-IRS competes in Europe with Pergamon Financial Services, Questel, Data-Star, and STN International. In the United States, ESA-IRS competes with BRS Information Technologies and DIALOG Information Services. Since it is a government-sponsored agency, however, ESA-IRS does not compete for subscribers the way a for-profit organization does.

Some of ESA-IRS' databases are unique to the service. On-line database searchers in this country may be interested to know the command structure used on ESA-IRS is very similar to that used on DIALOG Information Service. In fact, the command structure for both started from the same program (RECON) about two decades ago.

Resources and Facilities

Processing Centers

ESA-IRS' central computer, a Siemens 7865 with ESA-QUEST software, is located in Frascati, Italy.

Customer Support/Sales and Marketing Services

ESA-IRS has sales and marketing offices in nine countries (see Table 1). The agency also offers customer support through many avenues. ESA-QUEST on-line tutorials supply the user with short, accurate, and up-to-date information on such topics as database descriptions, on-line ordering, and contact points in different countries. There is also the *Direct Message Hotline*, an on-line link to an ESA-IRS representative. On-line training is also available through an on-line facility called *QUESTLEARN*, which consists of self-instructional modules designed for basic training in the ESA-Quest search language. In addition, ESA-IRS offers five on-line training files representing a subset of the files available on ESA-IRS. These files offer training in the following databases: *CHEMABS*, *PASCAL*, *INSPEC*, and *INIS*.

The agency also offers in-person training seminars in the various ESA member states in conjunction with the National Center's own instructional programs. The courses cover topics ranging from introductions to the ESA-QUEST search language and the ESA-IRS files to more advanced courses on selected databases and subject areas.

ESA-IRS also provides a User Manual that contains instructions on accessing and navigating the system, database descriptions, a mini-manual, and a Pocket Guide. The latter provides more advanced users with contact names and phone numbers plus a summary of operations, databases, and sample searches. The agency also publishes a newsletter, *News and Views*, approximately once a month. The publication informs users of system improvements, forthcoming seminars, and major planned events.

Finally, ESA-IRS provides Information Processing Utilities (IPUs), including *Questlearn*, an interactive computer-aided training tool that allows an organization or individual to install training courses and make them available on-line to users in various locations.

Hours of Availability

ESA-IRS is available to subscribers 20½ hours each day. The system is down daily between 1:30 a.m. and 5:00 p.m. EST.

Processing Services

Pricing

The January 1989 price schedule implements a "new" ESA-IRS structure designed to eliminate the connect time charge—a policy the information industry has considered obsolete for a number of years. ESA-IRS' new pricing policy charges for the information a user accesses. The new price structure reduces overall costs of the searching phase while allowing use of all the available ESA-QUEST techniques to enhance the search quality. Pricing is for the actual information retrieved. Users extract and pay for only the most relevant data. The following describes what the pricing schedule includes:

- Housekeeping charge
  - –All on-line activities, whatever their nature, entail the use of resources. The use of these resources is covered by a flat housekeeping charge of 10 AU/hr. and is calculated from LOGON to LOGOFF.
- Access to the databases
  - –Session rate of up to 5 AU for access to individual databases.
  - –Session rate of 10 AU for user-defined QUESTCLUSTER irrespective of the number of files searched simultaneously (maximum number of files accepted in the QUESTCLUSTER is eight).
- Evaluating on-line information
  - –To evaluate search results low priced inspection output formats are provided named

ESA-IRS Sales and Marketing Offices

Belgium
Mr. E. Lapeysen,
C.N.D.S.T.
4, Bd. de l'Empereur
B-1000 BRUXELLES
(02) 5195643 telex 21157

Denmark (incl. Norway)
Mr. D. Nag. DTB Library
Anker Engelundsvej 1
DK-2800 LYNGBY
(02) 883088 telex 37148

France
Mr. Ph. Lequain, ESA/IRS
8-10 Rue Mario Nikis
F-75738 PARIS Cedex 15
(01) 42737203 telex 202746

Ireland
Miss N. Breen, IIRS
Ballymun Road
EI-DUBLIN 9
(01) 370101 telex 25449

Netherlands
Mr. P.J.C. Rosenbrand,
COBIDOC
PO Box 16601
NL-1001 RC AMSTERDAM
(020) 223955 telex 18766

Mr. C.L. Citroen
Stichting NIC
P.O. Box 36
NL-2600 AA DELFT
(015) 569330 telex 38071

United Kingdom
Mr. R. Kitley, IRS DIALTECH
Dept. of Trade & Industry
Room 392—Ashdown House
123, Victoria Street
LONDON SW1E6RB (01) 2125638 telex 8813148

Spain
Mr. Eliseo de la Fuente
INTA
Torrejon de Ardoz
MADRID
(01) 6755263 telex 22026

Sweden (incl. Finland)
Mr. A. Nord, IDC-KTHB
Valhallavägen 81
S-10044 STOCKHOLM
(08) 7878970 telex 1038

United States
Mr. Donald Black, President
Information Services Associates (ISA)
Los Altos, CA 94022
(415) 948-2326

TECHNICAL, SCAN, BROWSE, and BROWSE WITH ABSTRACTS.

- Obtaining Source Data

  –Source data can be obtained from formats named REFERENCE or ALL. These formats contain the qualifying information necessary for full document identification and therefore they carry the full "price tag."

- Search Output

  –Records retrieved may be TYPED, DISPLAYED, or PRINTED in any of the above formats and are charged at the quoted format rate.

- Download

  –Items to be kept in magnetic form for future reuse may be downloaded by means of the DOWNLOAD command and a specially designed format "Format X."

- Rebates

  –A rebate scheme now applies to all individual items extracted with REFERENCE, ALL, or X formats during one calendar month, whether extracted on-line, off-line, or through SDI profiles. The rebate scheme is applicable to individual passwords or groups of passwords from 750 items onward.

- Advantages

  –The service takes the stress out of on-line searching. The absence of connect time charges eliminates the strain of searching "against the accounting clock." The user, having paid the session rate, may remain in the selected file or QUESTCLUSTER for an indefinite period of time to search for information. Without connect time charges, users are more likely to browse an on-line service, and to feel more comfortable before actually going on-line to access the database or to download information.

  –Users can improve the quality of the search by inspecting the results of a search strategy in order to selectively choose the relevant records that will constitute the final output. This can be done by using the new inspection formats specially created as part of the new price structure: the costs for all formats used to perfect the search quality and relevance are kept deliberately low.

  –It minimizes costs and saves money. Greater efficiency can be obtained from refining an on-line search partially prepared on paper. Instant feedback is obtained from the system, leading to more complete results.

  –The technology can use a PC for more than just automating searches. The full advantage can now be taken of the power of the ESA-QUEST retrieval software.

See Table 1 for a current updated pricing schedule for searching databases through ESA-IRS.

Application-Specific Services

Electronic Mail

ESA-IRS offers a proprietary *Data Dissemination System* (*DDS*). *DDS* permits users to compose and store reports, send and receive stored items nationally and internationally, read incoming reports and memos, and electronically file reports and memos for instant and private retrieval.

Personal Time Series (PTS) Service

The *Personal Time Series* (*PTS*) Service permits a user to perform time series statistical analysis. A few commands permit the user to store any time series and keep it up to date. They can be retrieved, manipulated, combined, compared, or plotted on the user's terminal at any time.

Computer-Assisted Education

Questlearn is an integral part of ESA-QUEST, the ESA-IRS retrieval software. It allows the user to construct on-line training sessions at a terminal and make them available worldwide, tailored to customer needs, and with full interactive capacity. The application uses ESA-IRS' capability to store and interpret operational programs written in the Basic programming language.

Questmenu allows any ESA-IRS subscriber to personally install a database of items, searchable through a tree-structured search approach. The application can be used for both menu creation and retrieval. Only four essential commands, ENTER, CATALOG, LIST, and UNCATALOG, are used. In addition, a set of editing commands is provided.

Table 1. ESA-IRS Resident File Access Fees (effective 1/89)

ESA-IRS RESIDENT FILES		File access	Format charges for records TYPED, DISPLAYED or PRINTED					SDI per update	
NAME	**PROVIDER/PRODUCER**	**session rate**	**scan**	**browse without abstract**	**browse with abstract**	**reference or all**	**download [see (VI)]**	**each profile**	**each record**
ABI/INFROM [•]	(UMI/Data Courier)	5.0	0.02	0.10	0.14	0.95	1.05	2.0	0.85
ACID RAIN	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
ACOMPLINE/URBALINE [•]	(London Research Centre)	3.0	0.02	0.08	0.12	0.38	0.38	6.0	0.35
AEROSPACE DAILY. . .[see (V)]	(McGraw-Hill Inc.)	4.0	0.20	—	—	0.73	0.73	6.0	0.50
AFEE [•]	(Assoc. Française Etude des Eaux)	3.0	0.02	0.08	0.12	0.50	0.50	6.0	0.28
ALUMINUM [•]	(Materials Information)	4.0	0.02	0.06	0.10	0.42	0.48	4.0	0.26
ARTIFICIAL INTELLIGENCE	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
ASFA [•]	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
ASIAN GEOTECHNOLOGY [•]	(Asian Inst. of Technology	3.0	0.02	0.06	0.10	0.38	0.38	6.0	0.28
BIIPAM-CTIF [•]	(Centre de Recherches de Pont á Mousson)	3.0	0.02	0.08	0.12	0.50	0.50	6.0	0.28
BIOBUSINESS [•]	(BIOSIS)	5.0	0.02	0.08	0.12	0.99	0.99	3.5	0.45
BIOSIS [•]	(BIOSIS)	5.0	0.02	0.08	0.12	0.49	0.52	3.5	0.30
BNF ABSTRACTS	(British Non Ferrous Metals)	3.5	0.02	0.08	0.12	0.35	0.35	—	—
BRIX	(building Research Establishment)	2.0	0.02	0.08	0.12	0.50	0.50	6.0	0.34
BUSINESS SOFTWARE	(Information Sources Inc.)	5.0	0.02	0.10	0.14	0.89	0.89	4.0	0.59
CAB	(CAB International)	3.5	0.02	0.06	0.10	0.45	0.56	5.0	0.43
CAD/CAM	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
CETIM	(Centre Technique des Industries Mécaniques)	3.0	0.02	0.08	0.10	0.36	0.36	6.0	0.26
CHEMABS	(Chemical Abstracts Service)	5.0	0.02	0.13	—	0.72	0.72	5.5	0.53
CHEMICAL ENGINEERING ABS	(The Royal Society of Chemistry)	4.0	0.02	0.08	0.12	0.61	0.61	6.0	0.36
CISDOC [•]	(ILO-Health & Safety Information Centre)	4.0	0.02	0.08	0.12	0.70	0.70	6.0	0.40
COMPENDEX	(Engineering Information, Inc.)	5.0	0.02	0.08	0.12	0.65	0.70	6.0	0.40
CONFERENCE PAPERS INDEX [•]	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
CURRENT BIOTECHNOLOGY ABS	(The Royal Society of Chemistry)	4.0	0.02	0.08	0.12	0.64	0.64	6.0	0.36
DATA DISSEMINATION SYSTEM	(ESA-IRS Electronic Mail Service)	H	—	—	—	—	—	—	—
DELFT HYDRO [•]	(Delft Hydraulics Laboratory)	3.0	0.02	0.06	0.10	0.44	0.44	6.0	0.22
EDF-DOC	(Electricité de France)	2.5	0.02	0.06	0.10	0.34	0.34	6.0	0.22
ELCOM	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
ELECTRONIC MAGAZINE, THE. . .[see(IV)]	(Learned Information)	H	—	—	—	see (v)	—	—	—
EMIS. . .[see(IV)]	(Institution of Electrical Engineers)	5.0	0.02	0.08	0.12	see (v)	see (v)	—	—
ENEL [•]	(Ente Nazionale per l'Energia Elettrica)	3.0	0.02	0.06	0.10	0.35	0.55	6.0	0.25
ENERGYLINE	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
ENGINEERED MATERIALS ABSTRACTS	(Materials Information)	4.5	0.05	0.10	0.14	0.56	0.67	6.0	0.40
ENVIROLINE	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
EUDISED [•]	(Council of Europe)	3.0	0.02	0.06	0.10	0.38	0.38	6.0	0.25
FLUIDEX	(BHRA Fluid Engineering)	4.0	0.02	0.08	0.12	0.59	0.59	6.0	0.32
FSTA [•]	(International Food Information Service)	3.0	0.02	0.08	0.12	0.48	0.48	6.0	0.30
FSTA (VITIS) [•]	(International Food Information Service)	3.0	0.02	0.08	0.12	0.48	0.48	6.0	0.25
GLASS FILE	(Stazione Sperimentale del Vetro)	3.5	0.02	0.08	0.12	0.73	0.73	6.0	0.40
HEATFLO	(Heat Transfer & Fluid Flow Service)	4.0	0.02	0.08	0.12	0.63	0.63	8.0	0.41
HSELINE	(Health & Safety Executive)	2.0	0.02	0.06	0.10	0.31	0.35	6.0	0.25
IBSEDEX	(Building Services Research Info. Assoc.)	2.5	0.02	0.06	0.10	0.40	0.40	6.0	0.32
IFIS CLUSTER	(International Food Information Service)	3.0	0.02	0.08	0.12	0.48	0.48	6.0	0.30
INFORMATION PROCESSING UTILITIES [•]	(ESA-IRS)	H	—	—	—	—	—	—	—

See page 107 for footnote.

Table 1. ESA-IRS Resident File Access Fees (effective 1/89) (Continued)

ESA-IRS RESIDENT FILES		**File access**	**Format charges for records TYPED, DISPLAYED or PRINTED**					**SDI per update**	
NAME	**PROVIDER/PRODUCER**	**session rate**	**scan**	**browse without abstract**	**browse with abstract**	**reference or all**	**download [see (VI)]**	**each profile**	**each record**
INSPEC	(Institute of Electrical Engineers)	5.0	0.02	0.08	0.12	0.72	0.99	6.0	0.48
INSPEC INFO. SCIENCE. . . [see(ii)] [•]	(Institute of Electrical Engineers)	H	—	—	—	—	—	—	
INTL. PHARMA. ABS. [•]	(American Society of Hospital Pharmacists)	3.0	0.02	0.06	0.10	0.41	0.41	6.0	0.32
IRRD [•]	(OECD)	5.0	0.02	0.08	0.12	0.42	0.42	7.0	0.24
ISMEC [•]	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
LABORATORY HAZARDS BULLETIN	(The Royal Society of Chemistry)	3.0	0.02	0.08	0.12	0.60	0.60	6.0	0.36
LABORDOC [•]	(International Labour Office)	4.0	0.02	0.08	0.12	0.67	0.67	6.0	0.40
LABORINFO [•]	(International Labour Office)	4.0	0.02	0.08	0.12	0.67	0.67	6.0	0.40
MASSLIT	(The Royal Society of Chemistry)	4.5	0.02	0.08	0.12	0.44	0.44	6.0	0.30
MATERIALS BUSINESS	(Materials Information)	4.5	0.05	0.10	0.14	0.56	0.67	6.0	0.40
MATHEMATICS [•]	(The American Mathematical Society)	3.5	0.04	0.10	0.14	0.57	0.57	6.0	0.41
MERLIN-TECH	(Merlin Gérin)	2.5	0.02	0.06	0.10	0.35	0.35	4.0	0.20
METADEX	(Materials Information)	4.5	0.05	0.10	0.14	0.56	0.67	6.0	0.40
METALS DATAFILE	(Materials Information)	5.0	0.16	0.25	0.30	1.20	1.40	2.0	0.80
MOLARS [•]	(National Meteorological Library)	4.0	0.02	0.06	0.10	0.42	0.42	5.0	0.33
NASA. . .[see(i)]	(National Aeronautics & Space Administration)	4.0	0.02	0.08	0.12	0.30	—	4.0	0.20
NATO-PCO [•]	(NATO-PCO)	3.0	0.02	0.08	0.10	0.54	0.54	6.0	0.32
NEW TECHNOLOGY CLUSTER	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
NTIS [•]	(National Technical Information Service)	3.5	0.02	0.08	0.10	0.51	0.51	3.0	0.32
OCEANIC [•]	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
ODE. . .[Online DATA ENTRY Service]	(ESA-IRS)	H	—	—	—	—	—	—	—
PACKABS [•]	(International Food Information Service)	3.0	0.02	0.08	0.12	0.48	0.48	6.0	0.30
PARKING FILE	(ESA-IRS)	H	—	—	—	—	—	—	—
PASCAL [•]	(CNRS-INIST)	3.0	0.02	0.08	0.12	0.52	0.52	6.0	0.49
POLLUTION [•]	(Cambridge Scientific Abstracts)	3.5	0.02	0.08	0.12	0.65	0.65	6.0	0.40
QUESTCLUSTERS USER DEFINED[•]	(ESA-IRS)	10.0	—	—	—	—	—	—	—
QUESTINDEX	(ESA-IRS)	H	—	—	—	—	—	—	—
ROBOMATIX	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
SAE	(Society of Automotive Engineers)	3.5	0.02	0.04	0.10	0.55	0.55	6.0	0.30
SATELDATA [•]	(ESA)	5.0	0.10	0.15	0.20	2.50	2.50	—	—
SPACECOMPS [•]	(ESA)	5.0	0.02	0.10	0.15	0.50	0.50	—	—
SPACE GLOSSARY [•]	(ESA)	5.0	0.02	0.04	0.08	0.20	0.20	—	—
SPACE PATENTS [•]	(ESA)	5.0	0.10	0.20	0.30	1.00	1.00	—	—
SPACESOFT [•]	(Computer Software Management Info. Center)	5.0	0.02	0.06	0.12	0.50	0.50	—	—
STANDARD & SPECIFICATIONS	(National Standards Assoc. Inc.)	3.5	0.02	0.08	0.12	0.65	0.65	—	—
TELECOMMUNICATION ABS	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
TELEGEN	(R.R. Bowker Company)	5.0	0.02	0.08	0.12	0.72	0.72	6.0	0.50
TRAINING ABI/INFORM. . .[see(iii)] [•]	(UMI/Data Courier)	H	—	—	—	—	—	—	—
TRAINING CAB. . .[see(iii)] [•]	(CAB International)	H	—	—	—	—	—	—	—
TRAINING CHEMABS. . .[see(iii)] [•]	(Chemical Abstracts Service)	H	—	—	—	—	—	—	—
TRAINING INSPEC. . .[see(iii)] [•]	(Institution of Electrical Engineers)	H	—	—	—	—	—	—	—

See page 107 for footnote.

Table 1. ESA-IRS Resident File Access Fees (effective 1/89) (Continued)

ESA-IRS RESIDENT FILES		**File access**	**Format charges for records TYPED, DISPLAYED or PRINTED**					**SDI per update**	
NAME	**PROVIDER/PRODUCER**	**session rate**	**scan**	**browse without abstract**	**browse with abstract**	**reference or all**	**download [see (VI)]**	**each profile**	**each record**
TRAINING METADEX. . .[see(iii)] [•]	(Materials Information)	H	—	—	—	—	—	—	—
TRAINING PASCAL. . .[see(iii)] [•].............................	(CNRS-INIST)	H	—	—	—	—	—	—	—
TRANSDOC [•].....	(The European Conference of the Ministers of TRansport)	3 5	0.02	0.08	0.12	0.67	0.67	7.0	0.35
ULRICH'S PERIODICALS	(R.R. Bowker Company)	3.5	0.02	0.08	0.12	0.50	0.50	6.0	0.39
WORLDS TRANSLATIONS INDEX [•] ..	(International Translations Centre)	4.5	0.02	0.08	0.12	1.22	1.22	6.0	0.70

(i) Special access procedures applly: contact ESA-IRS.(NASA: restricted to ESA MEMBER STATES)

(ii) Only available to organisations carrying out bona fide training programmes. For access terms please contact ESA-IRS. Offline prints are not executed; discounts not applicable.

(iii) Files only available for training purposes. Off-line prints are not executed; discounts not applicable.

(iv) Online/offline records; rates are item dependent. See online tutorial ***?PRICELIST***

(v) Special rate applies for subscribers to printed version.

(vi) For downloading conditions see Article 8 of Dial Up contract.

[•] Files also available under the ESA-IRS Trainee Programme (see item 13 of the pricelist). Offline prints not executed. Discounts not applicable.

H Housekeeping charged at 10 AU/hr, not applicable to files or services showing hourly rate charges.

• Items retrieved when using Quest Cluster are charged at the individual file level as shown on this price list

For 1989, the ESA Conversion Rate of 1 AU is:

Australian Dollar	1.46601	Irish Pound	0.77477
Austrian Shilling	14.61530	Italian Lira	1542.35000
Belgian Franc	43.45270	Norwegian Crown	7.55290
Canadian Dollar	1.44251	Spanish Peseta	137.35000
Danish Crown	7.89805	Swedish Crown	7.21100
Dutch Florin	2.33513	Swiss Franc	1.72839
Finnish Mark	4.92759	US Dollar	1.18424
French Franc	7.00860	English Pound Sterling	0.66498
German Mark	2.07709		

Any database created in this fashion can be private or made available for use by other ESA-IRS subscribers.

Networking Services

Access to ESA-IRS is available domestically only through Tymnet; internationally, the service may be accessed in about 19 countries through such networks as Datapak, Telepak, and Transpak. Contact ESA-IRS directly for more details.

Microcomputer/Software Services

ESA-IRS offers the *Mikrotel* communications software package. The program permits automated logon and search procedures. An automated file can be created either by using a text editor on a microcomputer or by saving commands during an on-line search. The latter involves opening a log file before starting an on-line search strategy the user wants to save. The program is not specific to ESA-IRS, and can automate communications with other on-line services as well.

On-Line Databases

ESA-IRS offers access to about 130 databases. Approximately 35 of these databases are available through a gateway arrangement with Pergamon Financial Data Services. The gateway arrangement, however, is not available to ESA-IRS subscribers in North America and, therefore, is not listed below.

Most of the databases offered on ESA-IRS are bibliographic, and are of a scientific or technical nature. The selection has an international flavor; most are at least partly in English.

For additional information on the databases described below, see the OL40 tab in Volume 2 of this publication.

ABI Inform	focuses on business information for management and administration decision makers. The database covers practices, policies, ideas, and concepts in all management disciplines.
Acompline	covers such urban topics as population, housing, and social planning and services; industrial development and environment; traffic engineering and transportation; economics and finance; and local government. Most of the references are of British origin; however, other countries including America are also covered.
Aerospace Daily	a newsletter published by Ziff-Davis Publishing Company that contains information on all aspects of the aerospace industry worldwide including governmental issues, military matters, and satellite and launch systems.
Afee	contains information on problems and aspects related to fresh water. The database covers such subjects as hydrogeology; health, hygiene, and safety; legislation; and research and development.
Aluminum	contains abstracts from *World Aluminum Abstracts*, a monthly service covering the world's technical literature on aluminum. The database coverage ranges from ore processing (exclusive of mining) through end uses such as transportation and building.
Artificial Intelligence	the on-line version of the monthly abstract journal concerned with all aspects of artificial intelligence and related technologies.
Asian Geotechnology	covers geotechnology engineering research and applications, focusing on publications originating in Asia. The database covers such subjects as soil and rock mechanics, foundation engineering, and earthquake engineering.
BIIPAM-CTIF	*BIIPAM* contains references to documents on metallurgical disciplines, as well as other fields within the engineering sciences. The references are in French, English, and German. *CTIF* is a subfile especially concerned with foundry matters.
BioBusiness	provides current information to business executives, financial analysts, and others about the business applications of biological and biomedical research.
BIOSIS	the world's largest indexing and abstracting service for biology and biomedicine in the English language. The database covers biology in its traditional areas, such as zoology; interdisciplinary areas, such as research medicine; and related areas, such as instrumentation.
BNF Metals	covers properties, processing, and uses of nonferrous metals together with economic and environmental information relating to the nonferrous metals industry. The database is the on-line version of the publication BNF *Non-Ferrous Metal* Abstracts.
BRIX	contains references, with abstracts in many cases, to books, conference proceedings, journal articles, and research reports dealing with building research topics. The database covers the years from 1950 to the present; about 300 journals are referenced.
Business Software	a catalog of software packages that are installed and supported including applications software, systems software, and utilities. Each record provides such information as company name, index terms, a description of up to 200 words, and price and terms.
CAB	contains all records published by CAB International and covers all agricultural sciences and certain related aspects of applied biology. Subject areas covered include agricultural management, dairy sciences, fruit production, nutrition, waste disposal, and rural energy production.

CAD-CAM	the on-line version of *CAD-CAM Abstracts*, a monthly abstract journal covering computer-aided design, testing, and manufacturing.
CETIM	provides information useful to the mechanical industry with emphasis on technology. The database is in French and covers such areas as general problems of firms, tests and measurements, thermal treatments, and machine parts.
Chemabs	contains chemical information based on the CA-Search tapes produced by the American Chemical Society's Chemical Abstracts Service. The database contains citations covering such areas as biochemistry, organic chemistry, macromolecular chemistry, and chemical engineering.
Chemabs Training	a subset of the *Chemabs* file, available at a low access fee for user training.
Chemical Engineering Abstracts	covers published information of use to practicing engineers. The database covers both practical and theoretical material, with a bias toward the practical side. In addition to chemical engineering, the database covers electrical and electronic engineering, as well as mechanical engineering.
CISDOC	an English/French database covering occupational health and safety. It covers such topics as occupational medicine and physiology, industrial toxicology, accident prevention, and work conditions.
Compendex	on-line version of *Engineering Index*, which summarizes and indexes worldwide literature significant to engineering disciplines. The database covers civil, chemical, mechanical, and electronic engineering, among other topics.
Conference Papers Index	indexes papers presented at scientific and technical conferences and meetings worldwide, provides information on the conference details, and includes information on obtaining the full text of the papers. The meetings covered deal with research and development in the life and physical sciences, engineering, and medicine.
Current Biotechnology Abstracts	covers scientific, technical, and "technocommercial" aspects of biotechnology. The technocommercial abstracts include business and legal issues and safety.
Delft Hydro	covers fluid mechanics and its application in technology and engineering. In addition, the database covers such related fields as hydrology, water resources, water pollution control, aquatic ecology, and policy analysis.
EDF-DOC	deals with practical problems related to energy technology. Sources for the database, which is in French and English, include Electricite de France (EDF) internal reports and conference proceedings. Main subject categories include energy sources; electric power production, transmission, and distribution; and domestic and industrial applications of electricity.
ELCOM	provides information on electronics and communications including electronic systems, electronic physics, theoretical and applied research, and business and marketing information.
EMIS	provides a compilation of the latest-published data on the properties of materials important in the fields of microelectronics and solidstate research.
ENEL	produced by the Italian Electricity Board, the database is a multidisciplinary file that supplies information on electrical power and related technologies. Conventional and alternate energy sources are covered.
Energyline	the on-line version of *Energy Information Abstracts*, covering such energy-related topics as petroleum and natural gas resources, coal resources, solar energy, and fuel production. Abstracts provide access to 200 core journals and other resources including surveys, statistical publications, and conference proceedings.
Enviroline	gives comprehensive coverage of the environmental sciences. The database covers such areas as pollution, weather modification and geophysical change, oceans and estuaries, and wildlife.

EUDISED R&D	the European Documentation and Information System for Education, produced by the Council of Europe in collaboration with national agencies. The database is a spin-off version of the printed abstract journal, *EUDISED R&D Bulletin*, and contains references to ongoing and completed European educational research and development projects.
Fluidex	designed to act as a problem-solving tool for the engineering or information scientist, the database covers all fields of fluid engineering. Topics covered include aerodynamics, meteorology, offshore technology, and fluid mechanics.
FSTA	Food Science and Technology Abstracts covers the field of food science including data on microbiology, hygiene, toxicology, agriculture, biochemistry, and marine products.
FSTA (VITIS)	covers the fields of viticulture and enology.
Glassfile	covers literature related to the scientific, technological, and historical aspects of glass and allied fields. The database, available in French, covers such topics as physics and chemistry of the vitreous state, properties of glass, and manufacturing processes.
HSELINE	provides access to a major source of references on the different aspects of health and safety at work. The source material includes documents acquired and produced by the UK Health & Safety Executive (HSE) and includes report literature, relevant legislation, monographs, and conference proceedings. In addition, about 250 periodicals are scanned.
IBSEDEX	covers all aspects of mechanical and electrical services in buildings. The database covers such topics as heating and cooling, energy management and sources, and air-conditioning and ventilation.
INIS	covers aspects of nuclear science including atomic and molecular physics, radiation sources and radioelements, and nuclear medicine.
INSPEC	contains bibliographic references from the world's published literature on electrical physics, electronics, control engineering, computer science, and information technology.
INSPEC Information Science	a subset of the *INSPEC* File, available at a low access fee for user training.
INSPEC Training File	an unchanging subset of the main *INSPEC* database, available at a low access fee for user training.
IPA	provides international coverage in the fields of development and use of drugs, pharmacy practice, and education. The database makes reference to problems concerning over 10,000 different drugs. Main subject areas covered include drug evaluation and testing, drug analysis, and pharmaceutical chemistry and technology.
ISMEC	provides information from a wide range of mechanical engineering journals and conference publications. The database covers such subject areas as management and production, measurement and control, and production processes.
Laboratory Hazards Bulletin	contains information on hazards likely to be encountered by chemical and biochemical laboratory research workers. The database includes information on hazardous chemicals and reactions, new safety precautions and legislations, and biological hazards.
Labordoc	covers industrial relations and labor law, employment and working conditions, social security, vocational training, and labor-related aspects of economics, social development, rural development, and technological change. Material for 75 percent of the database represents information about particular regions and countries. Documents are in several languages, with about 60 percent in English.
Laborinfo	covers law, regulations, judicial decisions, collective agreements, monographs, policy statements, and research papers by governments and intergovernmental agencies, employers' organizations, and trade unions. The database, produced by the International Labor office in Geneva, also covers all Social and Labor Bulletin (SLB) articles.

Materials Business	contains information on technical and commercial aspects of iron and steel, nonferrous metals, and nonmetallic materials (ceramics, polymers, composites, and plastics). The database covers such areas as engineering, environmental issues, and applications management topics.
Merlin-Tech	contains bibliographic references from international published literature in electrical and electronic engineering and related sciences.
Metadex	the on-line version of *Metals Abstracts*. The database covers applied and theoretical metallurgy together with related aspects of physics and chemistry.
Molars	covers such subjects as meteorology and climatology, surface oceanography and planetary atmospheres, fluid mechanics, and geophysics.
NASA	combines two semimonthly abstract journals, *Scientific and Technical Aerospace Reports* (*STAR*) and *International Aerospace Abstracts* (*IAA*). The database covers current worldwide literature on the science and technology of space and aeronautics. The database is not available to ESA-IRS subscribers in the USA.
NATO-PCO	contains references to the published results of scientific/technical meetings sponsored wholly or partly under the NATO International Scientific Exchange Programs.
NTIS	covers research, development, and engineering reports from over 250 U.S. Federal Government agencies (national and local government agencies, their contractors, or grantees). The database coverage is multidisciplinary, including such topics as aeronautics, atmospheric sciences, energy conversion, communications, and space technology.
Oceanic	summarizes and indexes worldwide literature on the oceans. The database covers such subjects as marine biology and biological oceanography, physical and chemical oceanography and meteorology, geology, and ships and shipping.
Packabs	the on-line version of *Packaging Science and Technology Abstracts*. The database provides abstracts on packaging from scientific, technical, marketing, and management literature. Each document contains an abstract in English.
PASCAL	covers the fundamental disciplines of physics and chemistry, life sciences (e.g., biology, psychology, medicine), applied sciences and technologies, earth sciences, and information sciences. Abstracts are generally in French; since 1982, however, English translations of keywords and titles have been included.
PASCAL Training	an unchanging subset of the main *PASCAL* database available at a lower access fee for user training.
Pollution	summarizes and indexes worldwide literature on pollution and the environment. About 90 percent of source material is in English.
Robomatix	the on-line version of *Robomatix Reporter*, a monthly abstract journal concerned with various aspects of robots, their applications, and impact on society. The database covers such subjects as Computer-Aided Manufacturing (CAM), product assembly and transport, Artificial Intelligence (AI) and planning software, and mechanical design.
Sateldata	contains various parameters of mechanical and electronic satellite equipment produced in Europe. The database covers completed projects as well as those under development. Equipment performance, characteristics, and physical dimensions are covered.
Spacecomps	contains information regarding spacecraft components. The database lists, for each component, such characteristics as the name of all the projects in which it has been used, procurement specifications, and quality approval.

Spacesoft	describes publicly available computer programs of interest to the aerospace industry and other high technology sectors including engineering, math and computer science, and the space sciences. Each record contains an abstract, as well as a detailed description of the computer program and its capabilities including data on program language, program size, distribution format, price of the program source code, and supporting program documentation.
Standards and Specifications	provides information on sources, status, and availability of standards and specifications issued by U.S. governmental bodies and industry on specific terminology, materials, performance testing, products, safety, and other requirements and characteristics of interest to a particular technology field. Such information as the standard number, current issue date, issuing organization, and Federal Supply Classification (FSC) and American National Standards Association card number are listed for each standard and specification.
Telecommunications	the on-line version of *Telecommunications Abstracts*, a monthly abstract journal concerned with various aspects of telecommunications and related technologies for research and applications. The database covers such subject areas as policy and regulation, telephony, satellites, and circuitry and transmission.
Telegin	gives information on the fields of genetic engineering and biotechnology. The database is intended to meet basic research and application demands; it also covers marketing, economics and legal issues, and educational and ethical impacts.
Transdoc	records information on literature and current research projects available on transport economics in ECMT-member and associated countries. The database covers such subject areas as transport systems and economics; political, planning, sociological, and management aspects; and environmental and energy issues.
Ulrich's Periodicals	contains citations to over 100,000 serial publications including international magazines, newsletters, and general interest publications published regularly. In addition, the database covers annuals, continuations, conference proceedings, and other serial publications.
WTI	the on-line version of the monthly publication *World Transindex*. The database contains the translation announcements collected by the International Translation Center and the Centre National de la Recherche Scientifique. *WTI* announces translations of literature relating to all fields of science and technology, from East European and Asiatic languages into Western languages, as well as from Western languages into French, Spanish, and Portuguese.

ESA-IRS offers some value-added search features to its subscribers. *Questindex* will cross-search all indexes available on specified databases for a specific search term. *Questindex* will indicate the number of hits, but the user cannot print or display the citations, as no retrieval actually takes place. The *Cluster Searching* capability, however, allows the user to define a group of databases to be searched simultaneously and print or display hits from any one or all of them.

Another feature offered on ESA-IRS is the *ZOOM* command. This command analyzes the contents of current search results, reports selectively according to user requirements, and suggests potentially useful search entries to be included in further retrieval statements.

Other Services

Primordial

Primordial allows a user to automatically order, from his or her terminal, paper copies or microfiches of original documents referenced in the ESA-IRS files. Suppliers then review the orders they are concerned with and indicate if they accept or reject them.

Current Awareness

The *Current Awareness* service provides automatic execution of saved and protected search profiles at each update of certain databases. The search results are then mailed to the user. This service is currently available for the following databases: *AGRIS*, *ALUMINUM*, *BIOSIS*, *CHEMABS*, *COMPENDEX*, *EDF-DOC*, *FOOD SCIENCE*, *HSELINE*, *INIS*, *INSPEC*, *IRRD*, *METADEX*, *NASA*, *NTIS*, and *PASCAL*.

Future Plans

ESA-IRS plans to continue developing innovative, value-added features to aid in the search and retrieval process. ■

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

Founded in 1981, Executive Telecom System, Inc. (ETSI) specializes in electronic information services for human resource professionals. A subsidiary of The Bureau of National Affairs, Inc. (BNA), ETSI's major product is The Human Resource Information Network (HRIN), an information retrieval and communications system. HRIN includes on-line databases, a current awareness service, gateways to the *Official Airline Guides and the Occupational Health Services' Hazardline* and *Environmental Health News* databases, and an electronic mail system. HRIN's databases include many BNA reports and newsletters, several of which are not available through any other on-line vendor.

ETSI also creates private-access communications networks for other companies, which can include private database files and electronic bulletin boards.

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COMPANY INFORMATION

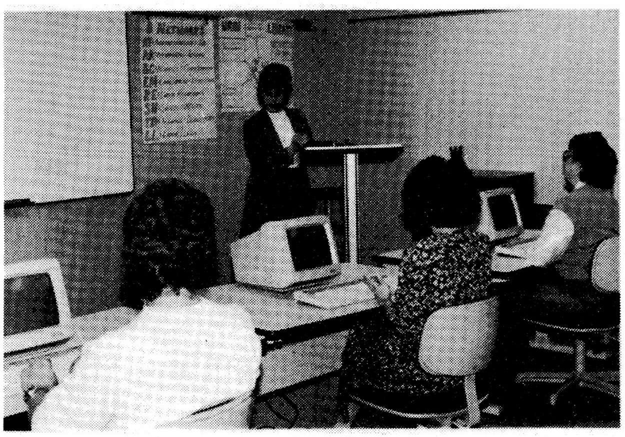
Executive Telecom System, Inc.
College Park North, 9585 Valparaiso Court
Indianapolis, Indiana 46268 (317) 872-2045,
(800) 421-8884

UPDATE: *ETSI has added several new databases to its Human Resource Information network. ETSI also expanded the databases available through its Human Resource Daily Developments database. In addition, the company increased the computing power of its processing center, a measure of its health. ETSI also plans to introduce a fax service to expedite the handling of search requests. Since our last update, basic connect-time rates for its HRIN service jumped from $48 to $60 per hour during prime time, and $32 to $40 per hour during non-prime time.*

Company Background

Executive Telecom System, Inc. (ETSI) was established in July 1981. It launched its primary service, The Human Resource Information Network (HRIN), several months later. HRIN is an on-line information retrieval and communications service designed by, and specifically for, human resource professionals. As such, it is one of the few services in the on-line industry that caters to a specific market niche.

ETSI became a subsidiary of The Bureau of National Affairs, Inc. (BNA) in 1984. BNA is a leading publisher of specialized information services on law, taxation, labor relations, environmental protection, and other public policy issues. Since the purchase, ETSI has produced and marketed on-line versions of many of BNA's information services and research reports. For example, in a recent six-month period, ETSI added 11 databases to HRIN: *BNA Policy and Practice Series, Labor Arbitration Information System, National Executive Compensation, National Public Employment Reporter, Hazard Communication Compliance Manual, Special Reports Library, ASPA Library Information, Printers' Resume Registry, Business Dateline, Job Absence and Turnover,* and *SchoolMatch Profiles.* Other additions included the full text of *Recruitment Today, On Compensation, On Employee Benefits and On Flexible Compensation, Hewitt Special Reports, BNA Occupational Safety and Health Daily, BNA Toxic Law Daily, BNA Antitrust and Trade Regulation Law Daily, BNA Federal Contracts Daily, BNA California Case Law Daily, BNA Illinois Case Law Daily, BNA New York Case Law Daily, BNA Banking Daily, BNA International Trade Daily, U.S. Law Week Daily, BNA Securities Law Daily,* and *BNA Tax Updates.*



Executive Telecom System, Inc. offers a variety of training classes for users of its Human Resource Information Network on-line system.

HRIN's on-line offerings are organized into eight separate categories designed to meet the needs of specialists within the human resource profession:

- Administration, Systems and Planning
- Affirmative Action
- Benefits and Compensation
- Employment and Recruiting
- Labor/Management Relations
- Labor/Legal
- Safety and Health
- Training and Development

HRIN also features a collection of databases specifically geared to corporate librarians (under the banner of the *Hu-*

▷

man Resource Library Network). Other ETSI services include private-access information retrieval and communications networks and private database files for such applications as recording and tracking arbitration cases, job posting and bidding, and private electronic bulletin boards.

Competitive Position

ETSI's The Human Resource Information Network stands alone as the only on-line information service catering to human resource professionals. As such, it has no real competition. While other on-line services may offer a few publications or services for this market, none come close to offering the selection that HRIN does.

ETSI considers revenue and subscriber information proprietary. If the number of new services added is indicative of an on-line service's overall health, however, then HRIN is healthy indeed. ETSI reports that most *Fortune* 500 companies now subscribe to HRIN.

One of HRIN's drawing cards is its extensive collection of newsletters and reports produced by ETSI's parent company, The Bureau of National Affairs Inc. HRIN offers more BNA services than any other on-line vendor. These services are among HRIN's most popular files. Also, HRIN is the only on-line vendor offering the full text of BNA reports.

RESOURCES AND FACILITIES

Processing Center

ETSI's Indianapolis, Indiana processing center contains three Digital VAX computer systems—11/785, 8530, 8200—with 5.5 gigabytes of on-line storage.

Any hard copy or display ASCII terminal, communicating word processor, or personal computer, including Digital VT52, VT100, VT200, and compatible models, can be used to access ETSI's on-line services. Transmission speeds of 300, 1200, and 2400 bits per second are accommodated.

ETSI's on-line services are available 24 hours a day, 7 days a week.

Customer Support Services

ETSI's Support Service Department offers toll-free customer assistance from 8 a.m. to 5 p.m., Indianapolis time, on regular business days. This free service aids users with questions about on-line searching of HRIN's files or other customer problems.

The ETSI Support Service Department offers a variety of customer training options, including periodic training workshops held at ETSI's Indianapolis headquarters and at various regional locations, on-site training, and telephone training. The cost of training varies with the option selected.

Subscribers to ETSI's The Human Resource Information Network receive a bimonthly newsletter that profiles new products and product enhancements and provides searching hints and other information. Subscribers can also purchase a User Guide ($40) that provides detailed information and searching instructions; a telecommunications software package called ETSI*LINK ($29); and a 100 percent Hayes-compatible, 1200 baud modem ($129).

Sales and Marketing Services

ETSI's Sales and Marketing departments are based at the company's home office in Indianapolis. In addition, ETSI maintains a nationwide sales force.

PROCESSING SERVICES

Pricing

A subscription to the service is necessary to use ETSI's The Human Resource Information Network. Subscription costs vary, but the most popular option is as follows:

Annual HRIN Subscription Package

- One-year access
- 52 hours connect-time usage (includes telecommunications charges)
- Two User Guides
- Two three-day HRIN workshop registrations
- Free 800 number support
- Free monthly newsletter
- Two hours personalized telephone training

(Additional pricing options are available upon request.)

A subscription is also required for access to the *Human Resource Current Daily Developments* database subset, available in Canada to iNet 2000 subscribers. In addition, a subscription is required for the *Human Resource Library Network*, available in both Canada and the U.S. Contact ETSI directly for pricing information for these two services.

Additional usage costs are based on an hourly connect-time rate, with no minimum monthly requirement. This rate varies with the specific information or database being accessed. Basic connect-time rates are $60 per hour (see Table 1). A discount of approximately 33 percent applies when HRIN is accessed during non-prime-time hours (8 p.m. to 7 a.m. EST weekdays and all hours on the weekends). Many HRIN databases also carry a royalty charge, which is

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

assigned by the producer. The royalty varies with the database and ranges from $6 to $72 per hour (see Table 2).

Costs for ETSI's private networks and custom programming options are unique for each application.

APPLICATION-SPECIFIC SERVICES

Executive Telecom System, Inc. offers a group of related products that provide on-line access to information in the human resource field. ETSI feels its database services allow subscribers to locate specific information quickly, efficiently, and economically.

ETSI's principal product, The Human Resource Information Network, contains a variety of services to meet various information needs, such as:

Research services—access to millions of journal articles and other documents.

News services—up-to-date professional news and daily developments.

Communications services—electronic mail and an electronic bulletin board.

Interactive software—on-line programs to increase efficiency and reduce costs.

On-line services—document retrieval; research services; and airline, auto, and hotel reservations.

ETSI's database services are designed to be user friendly; they can be used by subscribers with little knowledge of computers and on-line information retrieval systems.

NETWORKING SERVICES

Executive Telecom System, Inc.'s databases are available through the CompuServe and Telenet telecommunications networks; they can also be accessed through a direct-connect local telephone number. In addition, the *Human Resource Library Network* and *Human Resource Current Daily Developments* databases can be accessed through Telecom Canada's iNet 2000 network.

Three transmission speeds are accommodated: 300, 1200, and 2400 bps.

ON-LINE DATABASES

The Human Resource Information Network

HRIN provides access to a collection of products and services selected for their relevance to human resource professionals. It features research and statistical databases, reference reports, conference proceedings, laws, regulations, electronic mail, electronic bulletin boards, contract and arbitration information, and directory information.

The Human Resource Information Network includes the following reference and statistical databases:

ABI/INFORM—consists of thoroughly indexed 150-word summaries of the principal articles appearing in more than 800 leading business journals published worldwide.

Affirmative Action Planning Guide—an aid in preparing affirmative action plans and reporting to the Office of Federal Contract Compliance Programs (OFCCP) of the U.S. Department of Labor (DOL).

Arbitrator Biographies—provides detailed information on practicing labor arbitrators, including the arbitrator's education, experience, and industries and issues arbitrated.

ASPA Library Information Database—provides quick reference to research materials developed by the ASPA Information Center. Included are references to magazines, journals, newsletters, news clippings, survey sources, and books.

BNA Policy and Practice Series Database—a resource designed to help you set and administer policies and find answers to day-to-day workplace problems. Composed of five services, the database addresses a spectrum of human resource management needs such as Compensation, Personnel Management, Labor Relations, Wages and Hours, and Fair Employment Practices.

Business Dateline—provides the full text of more than 74,000 news articles in 180 regional business publications, daily newspapers, and news wire services throughout the United States and Canada.

Business Software Database—provides information on more than 10,000 business-, professional-, and system-oriented software packages for mainframe, micro-, and minicomputers.

Census Occupational Profiles—provides statistics on occupational availability by industry, earnings level, and educational attainment from a special tabulation of data from the 1980 Census.

Census Projections 1987-1992—information on occupational availability by race and sex based on projections of U.S., state, and Metropolitan Statistical Area labor force data.

Census Reporting Program—provides statistics on occupational availability for each of the 514 Detailed Occupations for which census data is obtained. The database is designed to help users obtain data for affirmative action planning.

Chemical Safety Data Guide—chemical identification, regulatory, and handling information for more than 430 substances covered by the OSHA Hazard Communication standard and state right-to-know laws.

Collective Bargaining Contract Library—one of three databases from BNA's Collective Bargaining Negotiations and Contracts Service, this database provides a bibliography of labor contracts covering thousands of workers. It lists contract expiration dates for more than 3,000 master and local collective bargaining agreements.

Collective Bargaining Contract Settlements—provides a quick overview of the major terms of thousands of labor contract agreements. The database provides information on company name, industry, union name and local number, location, settlement date, effective date, contract length, wage rate changes, other contract provisions, and number of workers affected.

College Recruitment—an up-to-date resume information retrieval service that provides companies with essential data about graduating, undergraduate, and graduate students. Participation in this service is available to all colleges and universities for students from a diverse range of disciplines. Arrangements to put resumes on this database are made with HRIN through the school's placement directors.

Conference Board Abstract Database—provides abstracts of key Conference Board Research Reports and Bulletins, articles from *Across the Board* magazine, statistical reports, and conference proceedings.

Consultants and Consulting Organization Directory—allows the user to reference contact information for more than 12,000 active consultants and consulting organizations, complete with fields of consulting activities, descriptions of services offered, industries served, names of the principal executives, staff sizes, and more.

Consumer Price Index Detailed Report Program—provides access to detailed current and historical consumer price index information for use in calculating wage and rental escalators to existing contracts, for monitoring cost trends in health care and other benefit areas, and for any other application in which information on current prices is required.

Daily Developments—contains over 65 different HR-related publications such as *Daily Labor Report, Daily Report for Executives, Personnel Journal, Personnel Administrator, Human Resource Executive, Training, Benefits Today*, and *BNA Pension Reporter* (see Table 3).

Decision Tree—designed to be a quick and easy-to-use guide to making the proper termination decision.

Employment and Policy Guide Database—provides practical information and policy guidance on a wide range of personnel and employee relations topics and issues.

BASIC CONNECT-TIME RATES (PER HOUR)

Any Terminal Speed	Prime Time 7 a.m.-8 p.m. ($)	Non-Prime Time 8 p.m.-7 a.m. ($)
	60	40

- These rates include remote telecommunications costs: Primary or Secondary.
- System Time = Indianapolis, Indiana time.

ELECTRONIC MAIL and BULLETIN BOARD connect charges are $18 per hour for all terminals, regardless of baud rate.

Access to HRIN is divided into two basic types of charges, connect-time and special program charges. Regular connect-time is a per hour charge based on the length of time a user is connected to HRIN until logoff. Special program charges are fees for a special product or database of information that is the property of another company. Not all information or databases on HRIN have a special program charge.

- Canadian subscribers should add 15 percent to the above rates due to the difference between Canadian and U.S. currencies.

Table 1. HRIN's basic connect-time rates.

Family Resources—provides coverage of the psychological, sociological, and educational literature relating to the field of family studies.

Harvard Business Review Database—contains the full text of more than 10 years of the *Harvard Business Review*, along with hundreds of older "classic" articles dating back to 1925.

Hazard Communication Compliance Manual Database—explains OSHA's Hazard Communication Standard and provides a step-by-step guide that covers every phase of establishing a hazard communication program.

Health Risk Appraisal—intended to improve the general health of an employee and thus reduce company medical insurance costs, absenteeism, and lost production.

Job Absence and Turnover—provides quarterly statistics on job absence and turnover rates, with breakouts by company size, industry, and region.

LABORDOC—contains worldwide references, with abstracts, to International Labour Organisation documents and other publications, reports, and technical documents in the fields of labor, industrial relations, management, vocational training, working conditions, and other labor-related areas.

LABORINFO—covers trends in labor and social affairs and focuses on legislation, landmark judicial decisions, Directives of the European Community, collective agreements, and policy documents produced by governments and employers' and workers' organizations.

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

	Per Hour: Connect Charges		Display & Print Charges	
	Prime Time ($)	Non-Prime Time ($)	On-line Per Item ($)	Off-line Per Item ($)
ABI/INFORM	115.00	95.00	0.50	0.80
Affirmative Action Planning Guide	72.00	52.00		
Arbitrator Biographies	60.00	40.00	6.30	
ASPA Library Information Database	84.00	64.00	0.15	
BNA Policy and Practice Series Database	115.00	95.00	1.60	1.65
Business Dateline®				
Without full text	110.00	90.00	0.35	
With full text	110.00	90.00	2.10	2.15
Business Software Database	90.00	24.00	1.10	1.15
Census	72.00	52.00		*0.13
Census Occupational Profiles	72.00	52.00		*0.13
Census Projections 1987-1992 Database	96.00	76.00		*0.13
Chemical Safety Data Guide	110.00	90.00	0.35	
Collective Bargaining Contract Library	102.50	82.50	0.60	
Collective Bargaining Contract Settlements	102.50	82.50	0.60	
College Recruitment Database ($0.50 to send post card)	60.00	40.00	0.25	
Conference Board Abstract Database	90.00	70.00	0.40	0.45
Consultants and Consulting Organizations Directory	80.00	60.00	0.40	
Consumer Price Index Detailed Reports (Average)	60.00	40.00		
(Major or Individual Items)	60.00	40.00	1.00	
Daily Developments Database —see TABLE 3				
Employment and Policy Guide Database	60.00	40.00	5.05	
Family Resources Database	90.00	70.00	0.35	0.40
Harvard Business Review Database	99.00	79.00	0.10	0.15
Hazard Communication Compliance Manual Database	120.00	100.00	2.40	
Job Absence and Turnover Database	120.00	100.00	1.10	
Labor Arbitration Information System Database				
Arbitrators	115.00	95.00	4.10	
Arbitration Cases	115.00	95.00	0.35	
LABORDOC	90.00	70.00	0.18	0.25
LABORINFO	90.00	70.00	0.18	0.25
LABORLAW	115.00	95.00	0.45	0.65
Microcomputers in Human Resource Management	90.00	70.00	0.50	
MicroReviews for Business	85.00	65.00	0.20	0.25
National Executive Compensation Database	60.00	40.00	10.10	
National Public Employment Reporter Database	102.50	82.50	0.35	0.40
Official Airline Guides	88.00	50.00		
Occupational Health Service	132.00	128.00		
MSDS SHEETS	132.00	128.00		75.00
Pay Equity	90.00	70.00		
PAYLINE™				
Participants	60.00	40.00	2.00	
Non-participants	60.00	40.00	5.00	
Personnel Journal Index	75.00	55.00	0.10	
Personnel Policies	60.00	40.00	4.00	
Printers' Resume Registry	90.00	70.00	1.10	
PsycFILE	85.00	65.00	0.10	0.15
Quality of Worklife Database	95.00	75.00	0.45	0.50
SchoolMatch Profiles Database	79.00	59.00	70.00 per search questionnaire 36.00 per search (with zip code change only) 11.00 per report card (with questionnaire) 36.00 per report card (without questionnaire)	
Seminar Clearinghouse Database	85.00	65.00	0.80	
Seminar Information Service Database	90.00	70.00	0.55	
State Personnel Problems	60.00	40.00	3.10	

Table 2. Special program charges (including basic connect-time rates) for HRIN's databases.

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

	Per Hour: Connect Charges		Display & Print Charges	
	Prime Time ($)	Non-Prime Time ($)	On-line Per Item ($)	Off-line Per Item ($)
A Terminations Decision Tree	70.00	50.00		
Time Out for Sports	90.00	70.00	5.10	
Training and Development Alert Database	85.00	65.00	0.30	0.40
Training Media Database	95.00	75.00	0.15	0.25
Unemployment Compensation Dates Database	72.00	52.00	0.10	
Unemployment Compensation Rates Database	72.00	52.00	0.10	
Unemployment Compensation Summaries Database	72.00	52.00	0.10	
Unemployment Compensation Wage Bases Database	72.00	52.00	0.10	

**Handling fees are added to any bulk mail (off-line) request. The Census Occupational Profiles, Census Reporting Program, and Census Projections 1987-1992 Database handling charges are $15.00 including postage.*

DATA FILES:

	Per Hour: Connect Charges		Display & Print Charges	
	Prime Time ($)	Non-Prime Time ($)	On-line Per Item ($)	Off-line Per Item ($)
Directory of U.S. Labor Organizations, 1986-87	60.00	40.00		
EMA Report of Cost Per Hire Data	60.00	40.00	9.10	
Tax Reform Act of 1986 —Compensation Planning (1)	60.00	40.00	6.10	
Tax Reform Act of 1986 —Summaries (1)	60.00	40.00	6.10	
Unemployment Compensation Glossary	72.00	52.00		

(1) Online print charge applies to each data file accessed.

SPECIAL PROGRAM CHARGES—SPECIAL REPORTS LIBRARY DATABASE
(Includes basic connect-time rates)

These connect-time charges represent the regular connect-time rate and a surcharge for some copyrighted reports. Not all reports in the Special Reports Library have a surcharge.

	Per Hour: Connect Charges		Display & Print Charges	
	Prime Time ($)	Non-Prime Time ($)	On-line Per Item ($)	Off-line Per Item ($)
Special Reports Library (basic connect-time for those reports without a surcharge)	60.00	40.00		
Affirmative Action Today	100.00	80.00		
Alcohol & Drugs in the Workplace	60.00	40.00	0.30	
Asbestos Abatement: Risks and Responsibilities	60.00	40.00	1.60	
ASPA Labor Shortage Survey 1988	90.00	70.00	.40	
The Changing Workplace: Staffing & Scheduling	100.00	80.00		
Conference Board Reports	90.00	70.00		
Corporate Affairs: Nepotism Office Romance & Sexual Harassment	60.00	40.00	1.10	
EEO Policies and Programs	85.00	65.00		
Employment Assistance Programs: Benefits, Problems, and Prospects	60.00	40.00	1.55	
Employee Award Programs	60.00	40.00	5.60	
Employer Bargaining Objectives, 1987	100.00	80.00		
Employer Bargaining Objectives, 1988	100.00	80.00		

Table 2. Special program charges (including basic connect-time rates) for HRIN's databases. (Continued)

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

	Per Hour: Connect Charges		Display & Print Charges	
	Prime Time ($)	Non-Prime Time ($)	On-line Per Item ($)	Off-line Per Item ($)
Employer Bargaining Objectives, 1989	100.00	80.00		
Employers and Child Care: The Human Resource Professional's View	90.00	70.00	.40	
Establishing a Foundation for Effective Employee Assistance Programs	90.00	70.00	.40	
General Procedures (for complying with Immigration Reform and Control Act)	102.50	82.50		
Guide to Federal Labor Laws	60.00	40.00		
Guidebook to Educational Resources	90.00	70.00	0.40	
Hazard Communication Compliance Manual	120.00	100.00	2.40	
Health Care Costs: Where's the Bottom Line?	100.00	80.00		
Immigration Reform: A Practical Guide	60.00	40.00	3.10	
Information for Employers About the Immigration Reform Law	102.50	82.50		
Interpretation of the New Federal Immigration Law	60.00	40.00	3.10	
Is Time Running Out On The 40-Hour Work Week?	90.00	70.00	0.40	
Managing the Aging Work Force	90.00	70.00	0.40	
National Survey of Worksite Health Promotion Activities	60.00	40.00		
Negligent Hiring	60.00	40.00	2.30	
Paid Holiday & Vacation Policies	100.00	80.00		
Part-Time and Other Alternative Staffing Practices	60.00	40.00	0.60	
Pay Equity	90.00	70.00		
Polygraphs and Employment	60.00	40.00	2.10	
Principles: Validation & Use of Personnel Selection Procedures	60.00	40.00	3.10	
Programs in Information Resource Management	60.00	40.00		
Recruiting and Selection Procedures	60.00	40.00	0.60	
Severance Benefits and Outplacement Services	60.00	40.00	1.35	
Sexual Harassment: Employer Policies and Problems	60.00	40.00	5.10	
Smoking In The Workplace: 1987 Update	90.00	70.00	0.40	
Social Security and Medicare Fact Sheet	60.00	40.00	2.60	
Substance Abuse In The Workplace: An Employer Perspective	90.00	70.00	0.40	
Total Quality Performance	90.00	70.00		
Training and Development Programs	85.00	65.00		
Training for New Technologies: Success Stories for the 1990s	60.00	40.00	1.10	
Where There's Smoke: Problems and Policies	95.00	75.00		

Table 2. Special program charges (including basic connect-time rates) for HRIN's databases. (Continued)

LABORLAW—provides 218,000 abstracts with indexing and case identification information for decisions by federal and state courts, arbitrators, and administrative agencies that pertain to labor relations.

Microcomputers in Human Resource Management—a specialized directory of personal computer software for human resource management applications. It includes information on more than 400 microcomputer-based software packages for virtually any personnel function.

MicroReviews for Business—provides reviews, in digest form, of top-rated microcomputer software, hardware, and books for business and professional users.

Executive Telecom System, Inc.
Human Resource Information Network (HRIN)

	Per Hour: Connect Charges		
	Prime Time ($)	Non-Prime Time ($)	Per Article Display & Print Charges ($)
AIDS Policy and Law	102.50	82.50	0.60
BNA'S Alternative Dispute Resolution Report	102.50	82.50	0.60
BNA Antitrust and Trade Regulation Law Daily	60.00	40.00	6.10
Asbestos Abatement Report	102.50	82.50	0.60
BNA Banking Daily	60.00	40.00	6.10
BNA's Banking Report	102.50	82.50	0.60
Benefits Today	102.50	82.50	0.60
Bulletin on Training	102.50	82.50	0.60
Bulletin to Management	102.50	82.50	0.60
Business Tax Report	102.50	82.50	0.60
BNA California Case Law Daily	60.00	40.00	6.10
Chemical Regulation Reporter	102.50	82.50	0.60
Chemical Substances Control	102.50	82.50	0.60
THE CONFERENCE BOARD BRIEFING	90.00	70.00	0.10
Construction Labor Report	102.50	82.50	0.60
Daily Labor Report	102.50	82.50	0.60
Daily Report for Executives	102.50	82.50	0.60
BNA's Employee Relations Weekly	102.50	82.50	0.60
Employment and Training Reporter	102.50	82.50	0.60
Employment Guide Newsletter	102.50	82.50	0.60
BNA Environment Daily	60.00	40.00	6.10
Environment Reporter	102.50	82.50	0.60
Fair Employment Practices Summary of Latest Developments	102.50	82.50	0.60
BNA Federal Contracts Daily	60.00	40.00	6.10
Government Employee Relations Report	102.50	82.50	0.60
The Government Manager	102.50	82.50	0.60
Hewitt Special Reports	95.00	75.00	0.35
HR Systems Report	75.00	55.00	0.10
HR/PC ONLINE	100.00	80.00	0.35
Human Resource Executive	90.00	70.00	0.35
BNA Illinois Case Law Daily	60.00	40.00	6.10
Immigration Policy and Law	102.50	82.50	0.60
Individual Employment Rights	102.50	82.50	0.60
Insurance and Risk Management for Business and Goverment	102.50	82.50	0.60
BNA International Trade Daily	60.00	40.00	6.10
Job Safety and Health	102.50	82.50	0.60
Labor Relations Week	102.50	82.50	0.60
The National Report on Substance Abuse	102.50	82.50	0.60
The National Report on Work and Family	102.50	82.50	0.60
BNA New York Case Law Daily	60.00	40.00	6.10
Occupational Safety and Health Reporter	102.50	82.50	0.60
BNA Occupational Safety and Health Daily	60.00	40.00	6.10
BNA Pension Reporter	102.50	82.50	0.60
BNA Pensions and Benefits Daily	60.00	40.00	6.10
Personnel Administrator	90.00	70.00	0.40
Personnel Journal	75.00	55.00	0.10
Recruitment Today	80.00	60.00	0.25
Resource	90.00	70.00	0.40
Retail/Services Labor Report	102.50	82.50	0.60
Right-to-Know Planning Report	102.50	82.50	0.60
BNA Securities Law Daily	60.00	40.00	6.10
Tax Management Weekly Report	102.50	82.50	0.60
BNA Tax Updates	60.00	40.00	6.10
BNA Toxics Law Daily	60.00	40.00	6.10
Toxics Law Reporter	102.50	82.50	0.60
TRAINING The Magazines of Human Resources Development	100.00	80.00	0.35
U.S. Employment Opportunities - Advertising/Public Relations	75.00	55.00	0.30
U.S. Employment Opportunities - Banking/Finance/Securities Brokerage	75.00	55.00	0.30
U.S. Employment Opportunities - The Computer Field	75.00	55.00	0.30

Table 3. Connect-time rates and print charges for HRIN's news services.

	Per Hour: Connect Charges		
	Prime Time ($)	Non-Prime Time ($)	Per Article Display & Print Charges ($)
U.S. Employment Opportunities - Federal Goverment Employment	75.00	55.00	0.30
U.S. Law Week - Daily Edition	60.00	40.00	6.10
Unemployment Compensation News	72.00	52.00	0.10
Union Labor Report Weekly	102.50	82.50	0.60
Newsletter	102.50	82.50	0.60
BNA Washington Insider	60.00	40.00	6.10
What's New in Collective Bargaining Negotiations & Contracts	102.50	82.50	0.60
White Collar Report	102.50	82.50	0.60

THE SOMMERS LETTER (Option Code SOMMER)

The Sommers Letter is an economic briefing service from The Conference Board that alerts you to important developments—present and emerging—affecting your business and your operating decisions.

	Per Hour: Connect Charges		
	Prime Time ($)	Non-Prime Time ($)	Per Article Display & Print Charges ($)
The Sommers Letter	99.00	80.00	0.10

TIMEOUT FOR SPORTS (Option Code TOFS)

Written by a television sports journalist, Timeout for Sports provides profiles of people in the sports world, insight into the latest developments, opinions, predictions, and the "story behind the story." It is designed for both the sports "fanatic" and the occasional spectator who would like to learn more about the world of sports. New columns are added each Monday and Wednesday.

	Per Hour: Connect Charges		
	Prime Time ($)	Non-Prime Time ($)	Per Article Display & Print Charges ($)
Time Out For Sports	90.00	70.00	5.10

Table 3. Connect-time rates and print charges for HRIN's news services. (Continued)

National Executive Compensation Database—provides survey information on salaries, bonuses, and other benefits for 28 executive positions, along with information on bonus plans and director's pay.

National Public Employment Reporter Database—a comprehensive source of information on public sector labor relations that provides access to all legal decisions and orders issued by state labor relations boards and commissions since 1979.

Occupational Health Services—contains *Environmental Health News*, which provides current information on court and agency actions and significant medical and scientific developments; also contains *Hazardline*, which provides detailed information on more than 3,600 hazardous chemicals.

Official Airline Guides—contains airline schedules for over 2 million direct and connecting flights representing more than 700 airlines worldwide. Fare information is available for thousands of North American direct and connecting flights, along with direct flights between major North American cities and destinations throughout the world. Flight reservations can be made on-line. In addition, OAG includes information for more than 17,000 hotels in North America, more than 9,000 in Europe, and more than 3,000 throughout the Pacific area.

PAYLINE—an on-line compensation database. It includes compensation data for the employee relations and legal professionals, broken down by job, industry, location, and company size. The database also includes exempt salary practices data, broken down by industry, location, and company size.

Executive Telecom System, Inc. Human Resource Information Network (HRIN)

Personnel Journal Index—information on *Personnel Journal* reprinted articles including the title, author, date, reprint number, and brief descriptors.

Personnel Policies—provides model policy statements, covering a variety of topics from absenteeism to performance appraisals.

PsycFILE—covers the world's literature in psychology and related disciplines in the behavioral sciences and contains abstracts of periodic literature and technical reports dealing with applied and industrial psychology.

Quality of Worklife Database—provides 3,000 bibliographic citations and abstracts on articles that focus on the interaction between work and family life, how each is affected by the other, and what families and companies are doing to address problems raised by these interactions.

SchoolMatch Profiles Database—a compilation of nearly 16,000 public school system profiles designed as a unique employee benefit to help aid corporations with relocation decisions. Private, parochial, and international schools are also included. A 22-factor analysis, customized by each individual employee, will result in a report on the various school systems in the specific area that most closely match the needs and preferences of the employee's family.

Seminar Clearinghouse Database—contains over 60,000 seminar listings and 40,000 separate evaluations. Seminars may be accessed by title, topic, date, location, and sponsor.

Special Reports Library—provides access to a collection of reports, surveys, bibliographies, and other special information files from a variety of information providers.

State Personnel Problems—designed to provide those responsible for personnel administration with a handy, dependable reference source of pertinent laws, regulations, and personnel practices for most forms of employment. Laws and regulations are explained in practical, everyday language; exact wording of statutes is provided where necessary.

Training and Development Alert—summaries of articles on training and development from more than 150 U.S. and international journals. The database also includes abstracts of books and sections of books that deal with training.

Training Media—references and contact information, with abstracts, on training programs and educational materials on media such as videotapes, videodiscs, 16-mm. films, audiocassettes, and filmstrips. Among the topics covered are career development guidance, technology, computers, engineering, management principles, office procedures, supervision, smoking, drugs, productivity, job satisfaction, motivation, electronics, photography, law, industrial safety, exercise and fitness, foreign languages, and leadership.

Unemployment Compensation Dates Database—references the dates unemployment tax rates are issued and protest and voluntary contribution deadlines.

Unemployment Compensation Rates Database—provides quick reference to the minimum, maximum, and new employer unemployment tax rates.

Unemployment Compensation Summaries Database—provides information on state regulations, covering such unemployment compensation topics as coverage and reports, contribution rates, transfer-of-experience rating, preclaim requirements, establishment of a claim, claims adjudication, administrative hearings, and benefit charges.

Unemployment Compensation Wage Bases Database—provides information on the dollar amount of taxable payroll defined by state regulations as covered wages for unemployment insurance purposes. The most recent three years are compared.

Other on-line reference information provided through HRIN includes the full text of numerous reports, surveys, research bulletins, laws, regulations, compliance guidelines, directory listings, collective bargaining calendars, and definitions of terms.

HRIN's current awareness services provide access to information on the latest developments in human resource management. These services include:

Human Resource Events Calendar—contains information on meetings, seminars, conventions, courses, and other important activities of interest.

BNA Executive Day—a daily electronic newsmagazine for business executives and professionals.

The Sommers Letter—a practical, nontechnical, economic briefing service that profiles important developments affecting business and operating decisions.

Bulletin Board—a unique opportunity to exchange ideas and company-specific information on key topics of interest with other subscribers.

Additional services include electronic mail, on-line ordering of documents abstracted in most databases, and special research and projects assistance.

Human Resource Library Network

The Human Resource Library Network, available in the U.S. and to subscribers of the iNet 2000 network in Canada, provides access to nine databases geared to those associated with the field of human resources. Included are *ABI/INFORM* (covering international business literature), *Arbitrator Biographies* (practicing labor arbitrators), *LABORLAW* (landmark court and agency decisions), *PsycFILE* (applied and industrial psychology), *Family*

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Resources (impact of family on work), *LABORDOC* and *LABORINFO* (international labor), *Management Contents* (business), and the *Quality of Worklife Database* (interaction of work and family life).

In addition, the Human Resource Library Network offers electronic mail and bulletin boards to allow direct communications with colleagues.

Human Resource Current Daily Developments

The *Human Resource Current Daily Developments* database provides full-text access to more than 65 specialized information services in the areas of administration and tax, affirmative action, employment and recruiting, labor relations, benefits and compensation, safety and health, and labor/legal. Table 3 lists the publications available through this database.

A subset of this database is available to Canadian subscribers through Canada's iNet 2000 network.

OTHER PROFESSIONAL SERVICES

Private Networks

ETSI can design, create, and maintain private-access information retrieval and communications networks. The following private networks have been developed with their respective associations: ASPA*Net, American Society for Personnel Administration; ACA/NET, American Compensation Network; NetPELRA, National Public Employment Labor Relations Association; EMANet, Employment Management Association; and EBRI-NET, Employee Benefit Research Institute.

Private Files

ETSI can provide private database files for such applications as recording and tracking arbitration cases, job posting and bidding, and private electronic bulletin boards.

FUTURE PLANS

ETSI continually upgrades the quality and quantity of human resource information available through The Human Resource Information Network; recent additions include policies and practices, absence and turnover rates, and relocation and employment information.

ETSI plans to introduce a fax service to expedite the sending of HRIN searches. Additionally, significant expansion of HRIN's resume databases is expected. ☐

GE Information Services

GE Information Services, a division of General Electric Company (GE), operates the world's largest commercially available teleprocessing network. Originally among the leading remote computing vendors, GE is now emphasizing its applied telecommunications services for businesses. These services include shared applications, micro integration, office communications, batch-mode data transfer, distributed data processing, and customized software.

GE also offers information retrieval services; a computer-based training system; and *QUIK-COMM*, an electronic mail service. Approximately 40 on-line databases are available to users of its network. These contain information on currency, demographics, economics, securities, energy, engineering and scientific applications, manufacturing, medical and health care, sales and distribution, and transportation. In addition, GE operates the General Electric Network for Information Exchange (GEnie), a consumer-oriented information service.

This report concentrates on GE Information Services' database and other information services. For additional information on its GEnie on-line service, see Report OL20-436-201.

REPORT HIGHLIGHTS: **PAGE**

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On-Line Databases 105

COMPANY INFORMATION

GE *Information Services*
401 N. Washington Street
Rockville, Maryland 20850 (301) 340-4000

UPDATE: *GE Information Services continues to bolster its menu of Electronic Data Interchange products and services, now seen as the new growth area for the company. GEIS has also enhanced its QUIK-COMM computer-based messaging system, to extend its utility, applicability, and reach. In addition, the company has added many new databases, especially in the international and domestic economics areas. Other files were eliminated. GEIS' GEnie on-line service now ranks number two in the industry behind CompuServe.*

Company Background

GE Information Services (GEIS), considered the company that commercialized the concept of time-sharing, was established in 1964. A division of General Electric, GE Information Services is one of GE's service-oriented businesses, which also include GE Credit Corporation. GE operates the world's largest commercially available teleprocessing network, currently used by more than 5,000 major companies worldwide.

Over the years, the company has evolved from a leading player in the time-sharing industry to a top vendor of telecommunications services for business. GEIS is now especially strong in Electronic Data Interchange (EDI) products and services, where it commands the market lead. GEIS' evolution reflects changes in the remote computing and computer services industries.

Although GE Information Services is best known for its value-added services (now including EDI services), it also offers nearly 40 public databases, covering demographics, economics (both domestic and international), securities, energy, manufacturing, engineering and scientific applications, and transportation. In addition, it operates the GEnie on-line service for consumers.

GE Information Services employs over 2,500 professionals in 33 countries.

Competitive Position

While its roots are in time-sharing, GE Information Services is now redirecting its efforts to Electronic Information and Data Exchange services. Competitors there include Control Data Corporation's REDINET, McDonnell Douglas, and Telenet. Currently, GEIS has the largest share of the market, with McDonnell Douglas second.

In terms of the general information services GEIS provides via its worldwide network, it competes with Telenet, ADP Autonet, Tymnet, Computer Sciences, and other providers of value-added networks (VANs). In on-line database services (GEnie), GEIS competes with The Source, CompuServe, General Videotex Corporation's Delphi service, and similar services. GEnie, which is less than four years old, has signed up subscribers at a brisk pace. Its subscriber base has passed the 150,000 mark, which ranks it number two in the industry behind CompuServe.

Giving GEIS an edge over its competitors is its teleprocessing network, the world's largest. It is available in more than 750 cities worldwide, 24 hours a day, 365 days a year. The network handles more than 250,000 messages per day, transmitting more than 300 million characters per hour.

In the future, GE can expect to face even more competition. The Bell Operating Companies, for example, are moving quickly and aggressively into the VAN market. To compete in this increasingly competitive market, GE

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DATAPRO RESEARCH, DELRAN NJ 08075 USA

Antigua
Antilles
Argentina
Australia
Austria
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Bolivia
Brazil
Brunei
Burma
Cameroon
Canada
Chile
Colombia
Costa Rica
Denmark
Dominican Republic
Ecuador
Egypt
Finland
France
French Antilles
French Guiana
French Polynesia
Gabon
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Malaysia
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Monaco
Netherlands
New Zealand
Nigeria
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Oman
Pakistan
Panama
Paraguay
People's Republic of China
Peru
Philippines
Portugal
Puerto Rico
Qatar
Réunion
Saudi Arabia
Singapore
South Africa
Spain
Sudan
Suriname
Sweden
Switzerland
Taiwan
Thailand
Tobago
Trinidad
Turkey
United Arab Emirates
United Kingdom
Uruguay
Venezuela
Virgin Islands

Table 1. Countries accessible by GE's processing network.

Information Services is repositioning its business, shifting its emphasis from remote computing services to applied telecommunications. It now claims to be the world's premier provider of advanced teleprocessing and network-based services.

RESOURCES AND FACILITIES

Processing Centers

GE processing centers feature more than $200 million in computing hardware. This equipment includes over 1,000 processing and communication computers, including 14 DPS 90/ACOS 1000s, 7 Honeywell DPS-8/70s, 2 IBM 3081s, 1 IBM 3090, and 1 IBM 4381. These systems are dispersed among GE's three processing centers located in Rockville, Maryland; Cleveland, Ohio; and Amsterdam, the Netherlands.

GE claims a 99.8 percent rate of processor availability, although its user contracts call for a minimum of only 90 percent. The company also cites a 99 percent rate of transaction completion assurance.

Customer Support Services

GE Information Services' worldwide field organization consists of almost 1,000 sales and technical representatives organized along industry lines.

Sales and Marketing Services

GE Information Services, operating out of 60 worldwide offices, has narrowed its marketing scope to concentrate on markets it considers to have the best return. GE has also been focusing on banking and financial services, manufacturing, energy, automotive, telecommunications, trade and transportation, retail, high technology, and general business applications. GE's goal is to increase its revenues at a rate exceeding the expected growth rate in these markets.

APPLICATION-SPECIFIC SERVICES

Electronic Mailbox—GE Information Services' electronic mail offering, the *QUIK-COMM System*, is linked with its worldwide teleprocessing network. QUIK-COMM's users may communicate with 10 European countries, Canada, Puerto Rico, Mexico, Saudi Arabia, and the U.S. With the integration of personal computers, the QUIK-COMM System can create, store, and organize messages off-line, as well as send and receive messages. Prompts are in various languages (messages are not translated). See Table 2 for GE's electronic mail pricing structure.

BusinessTalk System—Consisting of several modules designed to provide effective communications between an organization's headquarters and its field locations, the system includes three basic modules: a text database for fast access to information, a bulletin board for sharing information, and an electronic mail service for instant communications. Pricing is based on a sliding scale related to the number of users who can access the system simultaneously. Version 5.0 of BusinessTalk, released in February 1989, includes features that turn users' IBM PCs into workstations capable of accessing many services outside of those previously integrated into the BusinessTalk System.

*EDI*EXPRESS System*—EDI provides for the standards-based, electronic exchange of invoices, purchase orders, freight bills of lading, and other business documents between trading partners through host computer systems or personal computers. The system replaces traditional business procedures where the aforementioned documents are typically printed out on one company's computer systems, mailed, and reentered into the computer system of a vendor or customer. Version 7.0 of the *EDI*EXPRESS System* enhances the interactive Administrative system;

GE Information Services

Sending Charges[1]	Note	Memo	Document	
			First Page	Additional Pages
User Access[2]	(1-300 characters)	(301-1,500 characters)	(1,501-3,000 characters)	(Increments of 3,000 characters or portion thereof)
OFF-LINE	$0.35	$0.70	$1.00	$0.80/page
Other Usage Charges[3]				
Additional Copies/ Receipts[4]	$0.20	$0.40	$0.60	$0.50/page
Intrazone Service	$0.05	$0.15	$0.25	$0.25/page
Interzone Service	$0.10	$0.30	$0.50	$0.50/page

User/Administrative Charges[5]

Activity	Charge
Minimum Session Charge	$0.10/Session
Month-to-Date Usage Inquiry	$0.25/Inquiry
Month-End Usage Report	No Charge—First Copy
Mailbox Address	$1.00/Address/Month
Mailbag Address	$1.00/Address/Month
In-WATS 800 Access	$20.00/Hour
Directory Assistance:	
—Use Command	$0.25/Request
—User Directory	$1.00/Address/Month
—User Listings	$0.10/Entry/Month
Cross Community Alias	$1.00/Address/Month
Cross Community Service	$0.20/Address/Message

[1] SENDING CHARGES: Files sent or received via the QUIK-COMM System are classified as either NOTE, MEMO, DOCUMENT, or ADDITIONAL PAGES, and their size is measured in characters. As the sender exceeds the limits set forth in each classification, charges are based upon the subsequent classification. The carriage return and line feed pair at the end of each record is counted as two characters. Leading or embedded blanks in a record are counted as characters in the calculation of file size, while trailing blanks, header information (originating address, date of creation, etc.), and "subject" are not.

[2] USER ACCESS: OFF-LINE access applies to the processing of files by the commands of BATCH, TBATCH, ACCEPT, or FILE INPUT access applies to the transmission of a NOTE, a MEMO, a DOCUMENT, or ADDITIONAL PAGES whenever a user executes one of the following methods of data entry: Independent Run, FILE Command, *S,Filename session, *N,Filename session, FORWARD Command, and High Speed Service. A user will incur MARK III Service charges specified in the then applicable Teleprocessing Services Price Schedule when using FILE INPUT for creating and storing files on MARK III Service. *Charges for FILE INPUT access are 55% of the OFF-LINE access sending charges and other usage charges, if applicable.* ON-LINE access applies to the processing of files by any command other than those specified under OFF-LINE or FILE INPUT access. User interruption of either OFF-LINE or FILE INPUT access activities prior to normal completion of such activities results in the reclassification of such activities as ON-LINE access, which are then subject to ON-LINE access sending charges. *Charges for ON-LINE access are 200% of the OFF-LINE access sending charges and other usage charges, if applicable.*

[3] OTHER USAGE CHARGES: An INTRAZONE charge applies when the country of the receiving QUIK-COMM address (as defined by validation ownership of the user number associated with such as address) is Canada, Mexico, or Puerto Rico, or if QUIK-COMM users in that country must, by regulation, use the public data network to access the QUIK-COMM System. An INTERZONE charge applies when the country of the receiving QUIK-COMM address (as defined by validation ownership of the user number associated with such as address) is not the United States or identified as one of the countries in the above INTRAZONE description.

[4] ADDTIONAL COPIES/RECEIPTS: Each file sent to any address other than the first address constitutes an "additional copy." The originator is not charged for transmission of a file copied to its own address unless this address is the only recipient of said file. The first LIST or PRINT command issued by receiver is free of charge. All subsequent issuances of either command and all issuances of the SCAN command will be subject to "additional receipts" charges. Receiver's charges are based on the number of characters actually transmitted to the TTY buffer. Charges for the *LIST subcommand are the same as those for "additional receipts." Additional copies/receipts are subject to Interzone or Intrazone charges, if applicable.

[5] USER/ADMINISTRATIVE CHARGES: A Minimum Session Charge applies to QUIK-COMM System sessions during which any command other than EXIT, BYE, or HELLO is issued. Month-to-Date Usage Inquiry is available on a single-address basis only. In-WATS Access is charged per hour of terminal connect time, rounded up to the next hundredth of an hour. Monthly charges for QUIK-COMM Mailbox and Mailbag Addresses are based on the greatest number of Mailbox and Mailbag addresses valid for use during the billing month. The first copy of the Month End Usage (MEU) report is available via the QUIK-COMM System at no charge. Additional copies of the MEU will be charged at the then applicable rates shown in the U.S. Teleprocessing Services Price Schedule. User Listings permit QUIK-COMM administrators to place information directories on-line for reference by the administrator's users. Cross Community Aliases allow QUIK-COMM administrators to create aliases for Cross Community extended addresses for use by all users in the administrator's QUIK-COMM community.

Pricing for services shown shall be stated in Application Billing Units ("ABUs") based upon the charge rate per ABU specified in Company's Teleprocessing Services Price Schedule in effect at the time of usage in accordance with the terms of Customer's Agreement for Teleprocessing Services or Teleprocessing Service Multinational Access Agreement, whichever is applicable.

Table 2. Quik-comm system service price schedule

introduces new formats, reports, and selection criteria for Status Reports; and provides News Feature Access for its users.

*EDI*PC System*—This EDI microcomputer package lets EDI trading partners electronically prepare and exchange business data in standardized document formats. The system can be used either in a standalone mode or as a front end to an in-house host computer. The system is fully integrated with GEIS' *EDI*EXPRESS System.*

*EDI*T System*—This translation software enables companies to transmit and receive EDI documents in a standard format via GE's *EDI*EXPRESS System. The EDI*T System* translates a predefined input file generated by a customer's in-house applications into a standard format, such as ANSI X.12, MOTOR, OCEAN, RAIL, or UCS. Once it is in this form, a customer can then send the document to the *EDI*EXPRESS System* where it is processed and delivered to a company's trading partners.

*GE*TUTOR*—A computer-based training system that operates on GE's worldwide teleprocessing service, the system features 46 courses, ranging in cost from $50 to $650. Topics include data communications, IBM, database management systems, programming languages, application tools, operating systems, and end-user computing.

Data Management and Reporting—Includes more than 12 programs dealing with information retrieval, databases, and data analysis and statistics.

Engineering—Comprises 20 programs, including structural analysis, network design evaluation engineering, pre-cast concrete products design, heating and air-conditioning design and analysis, and a drill-hole database.

NETWORKING SERVICES

GE boasts the world's largest teleprocessing network. It consists of several thousand miles of connecting circuits, including land lines, microwave relay paths, undersea cables, and satellite links. Three host computer centers are located in Rockville, Maryland; Cleveland, Ohio; and Amsterdam, The Netherlands. The network interconnects 500 processing and communications computers and is accessed by more than 6,000 customers worldwide. The system is available by local telephone line in over 750 cities in 33 countries. Gateway access is available to public data networks in more than 95 countries.

GE provides telex access allowing U.S.-based QUIK-COMM users to send messages, via the electronic mail service, to telex terminals and addresses in the U.S. or overseas. In addition, GEIS provides QUIK-COMM connectors to IBM's PROFS and DISOSS, Digital's ALL-IN-1, and Wang OFFICE. Other services include QUIK-GRAM and the QUIK-COMM to FAX service.

GE has agreements with three International Record Carriers (IRCs) to provide connections with the Public Data Networks (PDNs). Mark*Net, Mark III, and MARK 3000 are accessible from more than 95 countries.

GE Information Services' Mark III network comprises three major elements: Mark III Foreground service, for conversational interactive time-sharing, transaction processing, and large database management systems; MARK 3000 service for IBM-compatible remote batch and interactive TSO processing; and Mark III GCOS Background service, for remote batch processing on Honeywell computers interfacing with the interactive Mark III Foreground service. Languages supported include Fortran-77, Cobol, PL/1, and Basic.

MARK 3000 service is available via two separate delivery systems running under the Multiple Virtual Storage (MVS) and Virtual Machine (VM) operating systems.

Mark*Net Asynchronous Service is available in more than 650 U.S. cities. ASCII, asynchronous, TTY-type terminals can connect to the Mark*Net Network through public or private dial-in facilities, dedicated terminal ports, or dedicated terminal concentrators. Both asynchronous and X.25 dedicated host interfaces are also available. Complementary Asynchronous Services include Asynchronous-to-3270 Protocol Conversion, Client Network Monitoring, and Symbolic (customized) Logon Capabilities. In addition, error-free asynchronous network transmission via xmodem, X.PC, or MNP is offered at all asynchronous locations. Mark*Net Asynchronous Service is available at transmission speeds of 300, 1200, 2400, and (on a field test basis) 9600 baud.

Synchronous Services include support for IBM 3270 SNA/SDLC, 3270 BSC, 3770 SDLC, and 2780/3780 BSC devices and hosts. Terminal access to the network is available via dedicated access connections at 62 U.S. locations or via public dial-in facilities at 200 U.S. locations. Transmission speeds of 2400 and 4800 bps are supported for dial access; 2400 to 19,200 bps for dedicated connections. Dedicated host connectivity is achieved via full-duplex communications facilities. Host access is available at 10 major U.S. locations (network centers) providing nationwide coverage for dedicated host connections. Host connection configuration parameters offer preconnection assistance to accomplish host configuration.

GE also offers Mark*Net X.25 Service, which provides communications between hosts using the CCITT-recommended standard interface protocol. X.25 benefits to the user are ease of interconnection of data processing devices of different manufacturers, due to its worldwide acceptance as a standard; highly reliable communications, due to automatic error correction; and reduced leased line costs, due to its virtual circuit capabilities. GE's X.25 Service is available locally in more than 60 countries outside the U.S. from Public Data Networks (PDNs).

GEIS also offers a Managed Network Services (MNS) solution. This is an international, network-intensive teleprocessing service that provides clients with network and session management of their own, and value-added, information systems. GEIS views MNS as a "synergistic integration" of its worldwide teleprocessing network, data processing centers, and global support resources. MNS encompasses network connectivity, local end-user support, equipment provision and maintenance, systems design and integration, applications integration, and value-added applications.

MICROCOMPUTER SOFTWARE/ SERVICES

GE Information Services provides clients who have an IBM Personal Computer with an integrated applications program that combines GE's teleprocessing network, central processing, and databases with local processing facilities. GE also provides access to its network to clients with other microcomputers, including the Apple II Plus and III with Micro-Courier and the Tandy Corporation TRS-80 Models II and III.

Hardware/Software Products

As an IBM value-added dealer, GE Information Services now provides the following software products for the IBM PC:

- *File Transfer Utility*—the transmission of microcomputer programs, word processing text, and data files to microcomputers

GE Information Services

- *Time-Sharing Interface (TSI)*—for interactive communications and file transfer between host computers and personal computers
- *MARK III Professional Workstation*—stored in an on-line library for downloading onto a PC diskette to facilitate communications with the host
- *Fortran Subroutines Library*—augments the IBM PC's Fortran for applications and systems developers
- *Personal Computer Hierarchical Indexed Sequential Access Method (HISAM)*—the MARK III Foreground database manager adapted for the personal computer

GE Information Services' standard TABOL III Software, a financial management system, has the capability to read and write a file in the DIF format to allow data transfer between Mark III services and the IBM PC VisiCalc software system.

The EDI*CENTRAL System

The EDI*CENTRAL System is a mainframe software package that allows an EDI user to translate EDI-formatted documents to and from the formats used by its internal business systems applications. The software provides the business systems integration required to realize the major benefits of using EDI.

ON-LINE DATABASES

GEnie

GEnie, the General Electric Network for Information Exchange (see Report OL20-436-201), represents the company's first excursion into home computing services. GEIS launched GEnie in 1985 in a bid to make use of its commercial teleprocessing network during non-prime-time hours. The service currently offers bulletin boards and special interest groups, news services, access to Grolier's *Academic American Encyclopedia*, a CB simulator, electronic mail, free software for downloading, real-time computer conferencing, shopping and "swapping" services, and computer games. It also offers financial services, travel services, and a gateway to Dow Jones News/Retrieval. It has more than 150,000 subscribers and ranks second in the industry behind CompuServe.

GEnie is available at 300, 1200, or 2400 baud at a prime-time rate of $18 per hour. Nonprime charges are $5 per hour for 300 bps, $6 per hour for 1200 bps, and $10 per hour for 2400 bps. Non-prime-time rates apply to use Monday through Friday from 6 p.m. to 8 a.m. local time and all day on Saturday, Sunday, and national holidays. There is also a sign-up fee of $29.95, but there are no monthly subscription charges. The sign-up fee includes a $10 usage credit, a GEnie User's Manual, and a subscription to GEnie's magazine, *LiveWIRE*.

GEnie is accessible via a local telephone call from more than 650 cities across the U.S. It is also available in four Canadian cities and in 20 cities in Japan via NEC.

GE Information Services offers an impressive array of on-line databases. Detailed information on most of these databases may be found in the On-line Databases section (Tab OL40) of this publication.

Currency

Currency Exchange—contains past and present exchange rate data for major world currencies. The database contains 81 currency codes with 14 codes added in January 1989.

Economics—U.S.

Citibase Weekly—weekly financial and U.S. economic data compiled by Citicorp Database services from a range of government, institutional, and private sources.

COMMARS—trade opportunity information from the U.S. Department of Commerce.

FTC—a Federal Trade Commission database with Securities and Exchange Commission data on 496 time series for 31 industry classifications.

PPIDATA—1,000 U.S. producer price indexes from the Bureau of Labor Statistics.

Quarterly Financial Report—quarterly aggregate statistics on the financial position of U.S. corporations by industry.

USCASTS—quarterly projections of gross national product and unemployment for the United States by 10 forecasters.

US-ECON—key economic and financial statistics taken from U.S. government and Federal Reserve Board press releases.

USNA—contains the complete published national income and product accounts data.

Economics—International

IFSDATA—complete coverage of the International Monetary Fund's International Financial Statistics.

IIFDB—data from the Institute of International Finance, which gathers statistics on the economies and debt positions of debtor countries.

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GE Information Services

▻ *IMFDOT*—exports and imports by major trading partners for the OECD and "Baker 15" countries. The information is from the International Monetary Fund's publication, *Directory of Trade Statistics.*

INTCOMP—international data adjusted to be comparable to U.S. terms.

JSD—produced by the Jiji Press, this database provides the following data daily: Tokyo Stock Exchange stock and bond data; Tokyo Stock Exchange bond data details; New York, American Stock Exchange stock data; Osaka Stock Exchange stock and bond data; all listed companies' settlement account data.

NRI/E Japan—a database containing economic and industrial time series relating to Japan.

UNIND—historical data by industry complied by the United Nations and published in the *Yearbook of Industrial Statistics.*

UNNA—national accounts data published by the United Nations and published in the *Yearbook of National Accounts.*

WBDEBT—data equivalent to that published in the *World Debt Tables* on public and private external long-term debt.

Energy Conservation and Management

Dwight's Energy Database—includes oil and gas production history on each of 500,000+ oil leases and gas wells on annual or monthly production for up to seven years.

CHEMTRAN—contains physical properties for 857 pure components for studies in heat and material balance work in gas processing and transmission and in crude oil processing.

OGJDATA—provided by PennWell Publishing Company, the database includes information on such topics as exploration and drilling, production, transportation, refining, imports, exports, stocks, demand/consumption, natural gas, price, finances, offshore, coal, nuclear, and hydroelectric.

Engineering and Scientific Applications

PPDS (Physical Property Data)—a database of properties for a wide range of chemical substances.

Government/Political

Electronic Legislative Reporting System—used mostly by lobbyists, contains information relative to the status of outstanding bills in Congress and the State houses.

NORA—provides information from the *FCC Daily Digest,* including press releases, notices, and summaries of FCC daily activity. The database also contains the FCC Library, which includes the complete text of comments, orders, briefs, letters, motions, and petitions.

Risknet—analyzes terrorism and political stability risk in 75 countries. The database is updated daily.

Manufacturing/Industry Information

Association of Home Appliance Manufacturers—includes economic indicators and historical data on home appliances manufactured in the U.S. from 1960 to the present.

Industrial Production—covers the monthly production data reported by the Federal Reserve Board. The data is usually available on the 15th of each month.

Industry—annual data profiling U.S. industries from the Office of Management and Budget and the International Trade Administration.

Labor—employment and earnings data by industry. Monthly data are compiled by the Bureau of Labor Statistics.

News

ComLine—Japanese news and information concentrating on the following subjects: computers, telecommunications, electronics, machinery and engineering, chemicals and materials, biotechnology and medical, economy and finance, and new products.

Sales and Distribution

*Distribu*Net*—designed to serve pharmaceutical manufacturers, wholesalers, retailers, hospitals, and other ambulatory health care providers dealing in generic pharmaceuticals with data on drug availability, prices, and credit terms.

IPM—sales and earnings forecasts for approximately 80 industries.

Pubnet—a database providing an EDI function for the American Association of Publishers. Its main focus is the college textbook industry.

Securities

Securities Database—up to 80 items of trading information on over 125,000 securities.

GE Information Services

☞ Transportation

EAASY SABRE—a user-friendly version of American Airlines reservation system. The system has schedules for more than 650 airlines, including facts on more than 25 million fares, 13,000 hotels, and 25 car rental agencies.

Mardata—maritime industry data on ship characteristics, charter fixtures, tanker casualties, ship purchases/sales, and other marine information.

MileMaker—a database from Rand McNally providing point-to-point mileages in the U.S.

OTHER SERVICES

TRADE*EXPRESS

TRADE*EXPRESS is a computerized service for creating, processing, and distributing international trade documents among exporters, freight forwarders, banks, carriers, customhouse brokers, and others involved in international trade. The system includes software and teleprocessing services that enable companies to electronically capture, process, and exchange shipment data. After the sales contract and payment arrangements are made, companies can use the system to create, deliver, and track the information appearing on critical shipping documents (e.g., commercial invoices, delivery permits/dock receipts, and shipment advisories).

DESIGN*EXPRESS

Announced in February 1989, this is a family of products designed to provide for the electronic processing and transmission of engineering/manufacturing product definition data and related information. A focus of the system is the transmission of patterns or blueprints and bills of material, from computer to computer, between trading partners worldwide.

The DESIGN*EXPRESS family of products consists of:

*DESIGN*PC*, a fully integrated microcomputer workstation for asynchronous and synchronous communications.

*DESIGN*DISPLAY System*, a microcomputer numerical control part programming workstation that is fully integrated with the DESIGN*PC System.

FUTURE PLANS

In conjunction with Golden Tulip International (located in the Netherlands), one of the world's largest hotel companies, GEIS will debut a state-of-the-art hotel reservation system in July 1989. ☐

GEnie (GE Network for Information Exchange)

COMPANY INFORMATION

GEnie (GE Network for Information Exchange)
% GE Information Services (GEIS)
401 North Washington Street
Rockville, Maryland 20850 (800) 638-9636

UPDATE: *This update features many new services and databases from GEnie (GE Network for Information Exchange). GEnie has revamped its prime-time and non-prime-time rate schedules. It also introduced the* Zmodem *protocol, an efficient protocol for downloading files from GEnie's software libraries. Also, GEnie added RoundTables in many areas.*

GEnie (GE Network for Information Exchange), a videotex service for the consumer market, specializes in computer-related information. Begun in October 1985, GEnie is a product of GE Information Services (GEIS), a division of the General Electric Company.

GEnie currently provides more than 100 on-line services, many of which are communications related. These include electronic mail, RoundTable Special Interest Groups, and a "LiveWire CB Simulator." Recently, GEnie added several significant news services, including *NewsGrid* and *Newsbytes*. It also offers other services, including financial and investment-related databases.

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On-Line Databases 203

Company Background

General Electric Information Services (GEIS) launched GEnie in October 1985. In less than four years, the consumer-oriented videotex service has attracted more than 163,000 subscribers, to gain the number two spot in its market.

GEnie's genesis is similar to that of its largest competitor, CompuServe. Both companies were launched by timesharing companies, in a bid to use idle capacity. GEnie was launched by GE Information Services (GEIS), the company that first commercialized the concept of timesharing. GEIS offers applied teleprocessing products and services, including office and corporate systems, dealer and sales systems, retail systems, electronic data interchange systems, financial management and reporting systems, and global electronic mailbox services, to more than 10,000 corporate clients worldwide.

To offer these services, GEIS developed one of the world's largest commercially available teleprocessing networks. While used heavily during the day, it was largely idle at night. GEIS created GEnie to put that excess capacity to use. GEnie became GEIS' first product for the home computing or consumer market.

GEnie provides a variety of videotex services, including:

- A LiveWire CB Simulator;
- Realtime Conferencing;
- RoundTable Special Interest Groups;
- Bulletin Boards;
- Electronic Mail;
- Travel Information;
- Computing News;
- Business News;
- Movie Reviews;
- Financial Services;
- Shopping Services;
- Professional Services;
- Electronic Games; and
- Reference Services.

While GEnie is steadily adding information-oriented services (e.g., *NewsGrid* and *Newsbytes)*, its accent remains on communications and personal computing.

Competitive Position

Like other General Electric divisions, GEnie's mandate from GE is to be first or second in its market. Considering that GEnie is not yet four years old, it has shown remarkable progress toward that difficult goal. During 1988, its subscriber base grew, and it now tops the 160,000 mark. While far behind CompuServe's tally of 550,000 subscribers, GEnie has swept by General Videotex Corporation's Delphi service.

GEnie can also expect increased competition from Prodigy, the Sears/IBM videotex company available in several cities. Prodigy is targeting the mass market and does not, for example, offer as much computer-oriented information as does GEnie.

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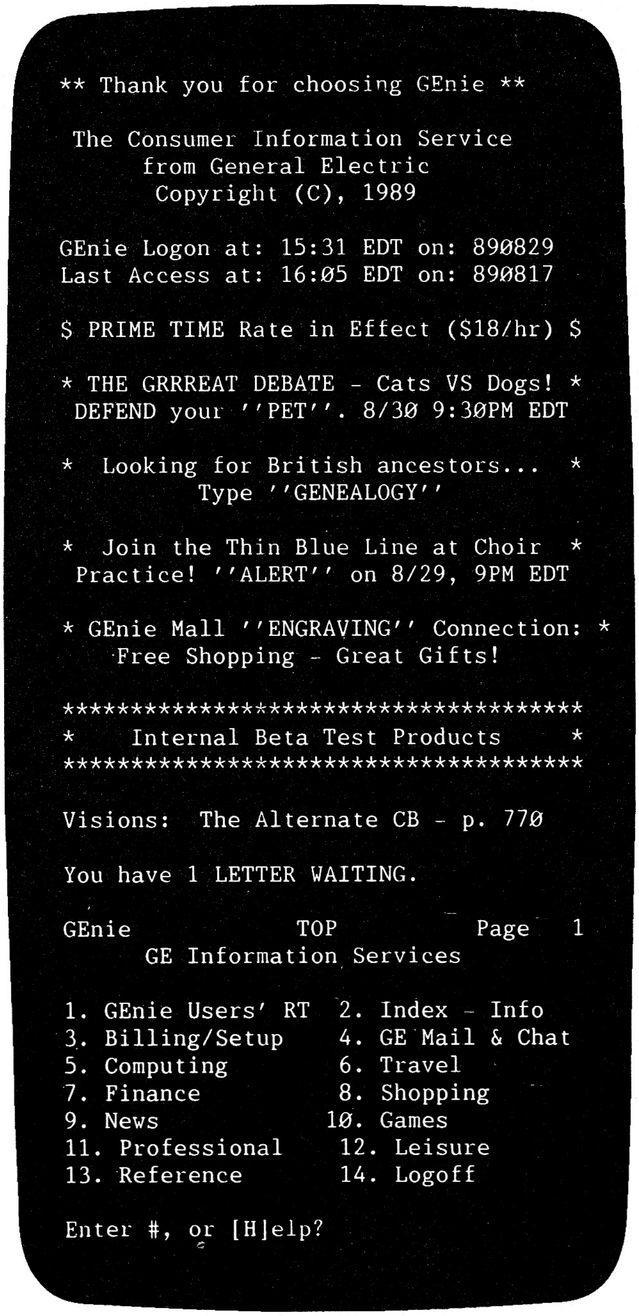
GEnie (GE Network for Information Exchange)



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** Thank you for choosing GEnie **

 The Consumer Information Service
      from General Electric
       Copyright (C), 1989

GEnie Logon at: 15:31 EDT on: 890829
Last Access at: 16:05 EDT on: 890817

$ PRIME TIME Rate in Effect ($18/hr) $

* THE GRRREAT DEBATE - Cats VS Dogs! *
 DEFEND your ''PET''. 8/30 9:30PM EDT

*  Looking for British ancestors...  *
           Type ''GENEALOGY''

*  Join the Thin Blue Line at Choir  *
 Practice! ''ALERT'' on 8/29, 9PM EDT

* GEnie Mall ''ENGRAVING'' Connection: *
   Free Shopping - Great Gifts!

**************************************
*    Internal Beta Test Products     *
**************************************

Visions:  The Alternate CB - p. 770

You have 1 LETTER WAITING.

GEnie             TOP            Page  1
      GE Information Services

1. GEnie Users' RT  2. Index - Info
3. Billing/Setup    4. GE Mail & Chat
5. Computing        6. Travel
7. Finance          8. Shopping
9. News            10. Games
11. Professional    12. Leisure
13. Reference       14. Logoff

Enter #, or [H]elp?
```

Figure 1. GEnie's welcome screen advertises upcoming conferences on GEnie's RoundTables, then moves quickly to a terse top screen.

GEnie's pricing is the key to its success; in fact, lower prices lured most of its early subscribers from other on-line services. GEnie's non-prime-time rates are the lowest in the industry—just $5 per hour at 300 bps and $6 for 1200 bps. CompuServe, on the other hand, charges $6.00 per hour for 300 bps access and *$12.50* per hour for 1200 bps access. GEnie's onetime sign-up fee of $29.95, which includes a $10 usage credit, a GEnie User's Manual, and a subscription to GEnie's *LiveWIRE Magazin*e, is also less than what similar services charge (though the fee was recently increased from $18).

With other companies lowering their rates, GEnie is well aware that pricing alone will not ensure its continued success. CompuServe, especially, offers many more services than does GEnie, though GEnie's RoundTables (akin to CompuServe's Special Interest Groups) offer an extensive selection of software.

To better compete, GEnie has added services intended to broaden its market base outside the consumer/hobbyist arena. For example, it offers American Airlines' *EAASY SABRE* reservation service at its basic rate, which translates into the lowest price for that service in the industry. It has also added financial and investment-related databases and more news services. In addition, GEnie offers a gateway to Dow Jones News/Retrieval (DJN/R).

This strategy has paid off; GEnie reports that 60 percent of its new subscribers are first-time users. Consumers, however, still compose most of its new subscriber base. GEnie's most popular offerings, the IBM and Apple RoundTables, and the CB Simulator (a "chat" feature permitting realtime communications), are prime examples. GEIS now markets GEnie in Canada and Japan and plans to soon make the service available in other countries as well. (CompuServe is also aggressively marketing its services internationally.)

RESOURCES AND FACILITIES

Customer Support Services

GEnie subscribers receive a GEnie *User's Manual* (which is available on-line as well as in hard copy). For service, questions, or comments, users can call its customer service department toll free at (800) 638-9636.

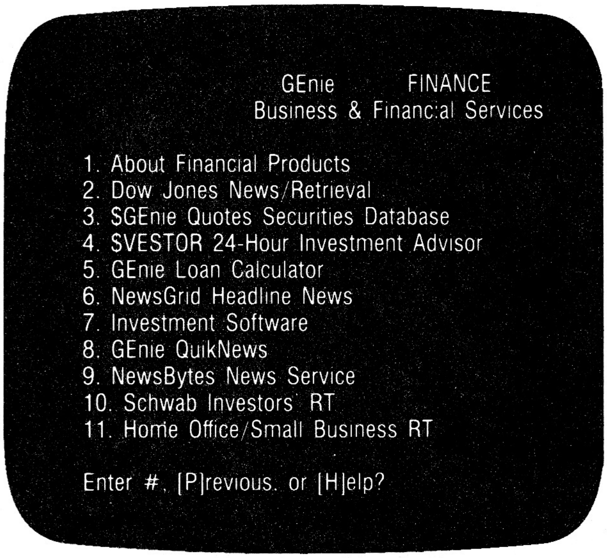
GEnie subscribers also receive a monthly magazine *LiveWIRE*, which covers new features and new commands. It also includes descriptions of recently added services, in-depth interviews with GEnie users, and reviews of GEnie services.

Pricing

GEnie's new prime-time rates became effective May 1, 1989. Its prime-time access rate for 300, 1200, and 2400 baud speeds is now $18 per hour. Prime-time applies 8 a.m. to 6 p.m. local time, Monday through Friday. Non-prime-time rates are as follows: 2400 baud non-prime-time rate is $10 per hour; 1200 baud access is $6 per hour; 300 baud access is $5 per hour. Non-prime-time rates apply 6 p.m. to 8 a.m., Monday through Friday, local time and all day on Saturday, Sunday, and national holidays.

In addition, there are separate subscription fees for *Grolier's Academic American Encyclopedia*, files accessed through the gateway to Dow Jones News/Retrieval, and for PhotoService International. There are also surcharges for some of GEnie's value-added financial services.

GEnie (GE Network for Information Exchange)



```
                    GEnie          FINANCE
                  Business & Financial Services

   1. About Financial Products
   2. Dow Jones News/Retrieval
   3. $GEnie Quotes Securities Database
   4. $VESTOR 24-Hour Investment Advisor
   5. GEnie Loan Calculator
   6. NewsGrid Headline News
   7. Investment Software
   8. GEnie QuikNews
   9. NewsBytes News Service
   10. Schwab Investors' RT
   11. Home Office/Small Business RT

   Enter #, [P]revious, or [H]elp?
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Figure 2. GEnie's finance menu offers a gateway to the Dow Jones News/Retrieval service.

NETWORKING SERVICES

GEnie is accessible by a local telephone call at 300 or 1200 bps from more than 500 U.S. cities through GEIS' own teleprocessing network. In addition, 2400 bps service is available in 63 U.S. cities, with more cities soon to be added. GEnie is also available in selected cities in Canada and Japan.

In December 1988, GE Information Services announced that its GEnie service will be available in 20 Japanese cities through NEC Corp. GEnie can be accessed through NEC in these cities by a local telephone call at any time throughout the day.

ON-LINE DATABASES

GEnie offers more than 100 databases, RoundTables (Special Interest Groups), and communications-related services follow. Descriptions of its major services.

Business and Financial Information Services

$ Dow Jones News/Retrieval—offers business and financial news; 15-minute delayed stock quotes; and current and back issues of the *Wall Street Journal* and many other publications.

$ VESTOR 24-Hour Investment Advisor—supplies users with an analysis of current market conditions and projections, including actual buy/sell signals and evaluations for over 6,000 individual securities. Pricing is by Vestor on a per-report basis.

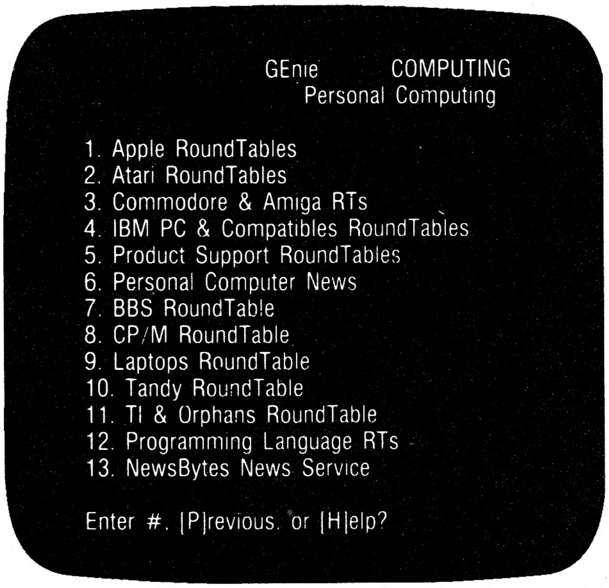
The HOSB RoundTable—for individuals and small companies who operate from home.

$ GEnie Quotes Securities Database—includes current (previous day's closing) and historical information relating to over 67,000 security issues of all types. Over 20 standard reports can also be requested ranging from stocks up/downs three to five days, gap stocks, new highs/lows, etc.

NewsGrid Headline News—a realtime news service compiled from the dispatches of some of the largest U.S. and international wire services, including UPI, Reuters, PR Newswire, the Associated Press, foreign wires, and financial wires.

USA TODAY DecisionLines—from Gannett News Media Services, this is a collection of 18 news summaries on industry topics of interest that are updated at 8 a.m. EST each weekday. The topics included are:

- Advertising
- Business Law
- Insurance
- Real Estate
- Market Trends
- Sports
- Banking
- Energy
- International
- Technology
- Travel



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                    GEnie          COMPUTING
                       Personal Computing

   1. Apple RoundTables
   2. Atari RoundTables
   3. Commodore & Amiga RTs
   4. IBM PC & Compatibles RoundTables
   5. Product Support RoundTables
   6. Personal Computer News
   7. BBS RoundTable
   8. CP/M RoundTable
   9. Laptops RoundTable
   10. Tandy RoundTable
   11. TI & Orphans RoundTable
   12. Programming Language RTs
   13. NewsBytes News Service

   Enter #, [P]revious, or [H]elp?
```

Figure 3. GEnie's computing menu offers many RoundTables for different computer manufacturers, and also news on personal computing.

GEnie (GE Network for Information Exchange)

- Issues & Debates
- Health
- Investing
- Telecom
- Weather
- Bonus Updates

Personal Computing Information Services

Apple Computers

Apple Macintosh RT—contains thousands of files—from games to utilities—for downloading. A variety of topics relates to the Macintosh and related hardware and software.

Macintosh Developers RT—supports developers of Macintosh software. Macintosh users and programmers answer questions in the bulletin board, and Mac enthusiasts share source code and programming utilities in the software libraries.

Apple II RT—all levels of expertise represented in the files available to download and the discussions on the Apple bulletin board. The most current system software updates from Apple Computer are also available.

Apple User Groups RT—provides Apple user groups with a readily available source of material for their newsletters, including articles, reviews, and columns. Public domain files for both Apple IIs and Macintosh, and a forum to discuss methods for enhancing their effectiveness, are also featured.

Apple II Programmers RT—is for anyone interested in the more technical aspects of the 8- and 16-bit Apple II computers.

FreeSoft Red Ryder Products RT—for registered owners of Red Ryder products. The distribution and on-line support of the FreeSoft products are officially provided.

Softronics RT—provides official on-line support for its terminal emulation software for IBM PCs and Apple II series computers.

Letraset RT—technical support area for registered users of Letraset software products. It also may interest anyone in art production who uses the Macintosh computer.

Symmetry Products RT—this RoundTable is primarily used to support registered owners of Symmetry products: Acta and PictureBase.

Atari Computers

Atari 8-Bit RT—is for owners of Atari 8-bit computers. It includes files for downloading and discussions of related topics.

Atari ST RT—supports all levels of expertise for Atari ST owners. Staff and experts from Atari are on-line with GEnie's own experts.

MichTron Products—supports MichTron products, 95 percent of which are for the Atari ST. Support for the package *GE Basic* is also available.

Atari Developers RT—this is a closed support RoundTable for Atari Developers supported by Atari Corporation.

Commodore Computers

Commodore RT—includes information and public domain programs for Commodore 64 and Commodore 128 owners.

Commodore Amiga RT—provides information and public domain programs for Commodore Amiga owners through its bulletin board and software libraries. GEnie claims one of the largest collections of Amiga software and computer art in the world is available through this RoundTable.

Pro/Am—includes information and software for Amiga programmers. It deals exclusively with Amiga programming issues. General discussions can be found on the Amiga RoundTable.

CP/M Computers

CP/M RT—supports various CP/M systems with files available for download and regular on-line meetings with experts.

Fog RT—a closed support file created by the International Nonprofit Computer Users Group for Osborne and other CP/M computers.

IBM PC and Compatibles

IBM PC RT—owners of IBM Personal Computers, compatibles, and clones. The software library contains over 10,000 files, and the bulletin board is home to a wide variety of topics concerning IBM PCs.

QMODEM Products RT—for users of qmodem, a communications program for IBM PCs and close compatibles.

Datastorm RT—product support RT for the IBM PC ProComm and PROCOMM PLUS communications programs.

GEnie (GE Network for Information Exchange)

Enable Products RT—supports Enable users with specific discussions and software for each of the main categories of Enable: word processing, spreadsheet, database, telecommunications, and graphics.

PROTREE Products RT—for registered owners of Protree's ALFA-III Bulletin Board Software.

BBS RT—designed for computer bulletin board authors, sysops, and users, and offering several major BBS systems and supporting utilities.

NoChange Products RT—product support for Nochange software, a bulletin board package for PCs and compatibles.

OdestaLink RT—product support for Helix and Double-Helix.

TeleVision Products RT—supports the TeleVision product line along with IBM PC and compatibles. This product is reportedly the first communications software package designed to send pictures.

Microsoft Windows Developers RT—provides Windows software developers a platform for discussing Microsoft Windows software development issues.

Microsoft

Microsoft Online KnowledgeBase—offers official on-line support for all Microsoft products available on GEnie.

Tandy

Tandy RT—for owners of the various Tandy brands, including the Models 1, 2, 3 and Color Computers. Over 1,000 files in the software library are available for downloading, and the bulletin board is home to many topics concerning Tandy computers.

Miscellaneous

Laptops RT—for users of all laptop computers to share information, tips, and programs for their computers. Those supported include the Tandy Models 100/102, 200, and 600; NEC; MS-DOS laptops; and many more.

TI & Orphans RT—this RoundTable supports all TI machines and a number of orphans. There is also a section for machines such as Coleco Adam and Commodore Vic-20.

Mumps RT—supports Mumps, a productive language for interactive business applications which are completely transportable from micro to mini to mainframes.

Forth Interest Group RT—provides user group support to Forth Interest Group members.

X-10 Powerhouse Product RT—for the computer-based control products that control everything electrical in a house or office.

Maggie Mae's PET-NET and Co.—offers entertaining, amusing, interesting, and helpful information about pets and wild animals.

Religion & Ethics RoundTable—includes a bulletin board and a software library. The RoundTable holds a regular Realtime Conference every Sunday night and discusses various religious and ethics issues in the news. It also offers a Religious News Summary and a questionnaire to test your knowledge of religions.

News and Information Services

Computing and High Technology News

Database RT—provides ongoing discussions of current developments in database management software for microcomputers.

Computer Connection RT—provides support for several media ventures including "The Computer Connection," the only nationally syndicated weekly, one-hour radio magazine; *PowerSystems Journal*, a publication for people with large mini-mainframe computer systems; and *Computer Living/NY*, a monthly newspaper for business and leisure computer users in the tristate New York metropolitan area.

Computer Shopper—a monthly publication that covers computer-related subjects.

A Networker's Journal—a weekly on-line publication which discusses computer-related subjects, especially telecommunications.

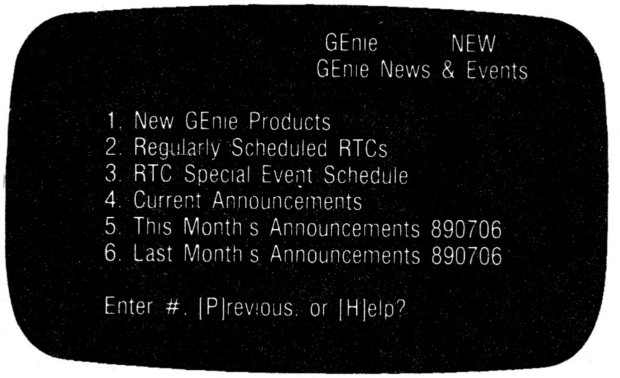
Computers & Technology—a collection of light and entertaining stories of events and new ideas in computing and technology.

Computing Across America—hosted by author Steve Roberts, who bikes across America on his recumbent, high-tech bicycle. From rural America to the big cities, he describes the interesting people and high technology.

ONLINE With HAYES—provides product support to owners of Hayes microcomputer products.

WordPerfect RoundTable—this RoundTable features users helping users. They can exchange information and tips on printer drivers, macros, graphics, models, templates, and programs, for use with WordPerfect Corporation products.

Ashton-Tate RoundTable—provides technical product information to users of Ashton-Tate products. It includes technical discussions and direct on-line contact with support technicians. All support material is generated by the



```
                    GEnie          NEW
                    GEnie News & Events

    1. New GEnie Products
    2. Regularly Scheduled RTCs
    3. RTC Special Event Schedule
    4. Current Announcements
    5. This Month's Announcements 890706
    6. Last Month's Announcements 890706

    Enter #, [P]revious, or [H]elp?
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Figure 4. GEnie's News & Events menu allows users to get up-to-date information on new products, as well as current and previous announcements.

Ashton-Tate Software Support Center, and is updated weekly or monthly, depending on the material.

Business and General News

Fight Back with David Horowitz—presented by the syndicated columnist and consumer advocate, David Horowitz, who covers topics of interest to consumers and offers weekly advice and warnings.

Genieus—a new RoundTable that is designed to help GEnie users get the most out of the service. It offers detailed information to all GEnie service subscribers on GEnie's many on-line services. It includes a bulletin board for posting messages and a Realtime Conference capability for on-line discussions. *Genieus* also offers information on GEnie news and events, including new product announcements and the day and time of specific Realtime Conferences in GEnie's many RoundTables.

QuikNews—a current awareness service that scans NewsGrid, USA TODAY stories, and features from GEnie's columnists and forwards stories that match subscribers' designated keywords.

Reference and Education Services

Grolier's Encyclopedia—an electronic encyclopedia that is updated quarterly and available through subscription.

Education RoundTable—an open forum for educational community, professional trainers, and the interested public to exchange information.

Rainbo Electronic Reviews—covers popular books, books for children, cookbooks, computer books, books on audiocassettes, and videocassettes.

Cineman Entertainment Information—provides entertainment reviews and information. There are reviews of current, recent, and old movies.

Hollywood Hotline Movie Reviews—concentrates on the top 50 current movies. Each review is 500 to 600 words long and includes the film's major credits.

Rensselaer Polytechnic Institute RoundTable—designed to help students and parents explore opportunities at Rensselaer. It includes information about curriculums, campus organizations, financial aid, student life, and career choices.

Japan RoundTable—used for exchanging information between GEnie service subscribers in the different cultures of Japan and North America. You can meet people and talk about living in Japan and learn about the Japanese culture. This RoundTable, like many others, includes a bulletin board, a Realtime Conference, and software libraries for downloading software.

Professional Information Services

LEGACY, the Law RT—a meeting place for the legal profession and people interested in learning more about the law. Discussions cover such topics as computer copyright law and current legal issues.

Medical RT—includes information for medical professionals and interested nonprofessionals. Current topics include AIDS research information, new medical technologies, and using computers in the medical profession.

Desktop Publishers (NADTP) RT—sponsored by the National Association of Desktop Publishers, and designed for professionals in the desktop publishing field and users of desktop publishing products.

Winchell Typesetting Service Bureau—provides desktop publishers and writers with a way to transform their work into high-resolution, camera-ready pages.

Public Forum NonProfit Connection RT—focuses on current events, news, and issues of interest to the public sector. Gives people interested in the nonprofit world a place to exchange facts and opinions on a wide range of subjects.

Photography RT—for both professional and amateur photographers, and includes the latest information on equipment, supplies, sales, and business management.

PhotoSource International—lists specific, current, photo needs of photobuyers in the publishing and promotion industries.

Writers' RT—serves the needs of writers. Allows users to communicate with other writers on business matters, or get feedback on their work.

Radio & Electronic RT—for people who want to learn more about electronics technology or radio communications.

GEnie (GE Network for Information Exchange)

- *MIDI/WorldMusic RT*—supports the MIDI computer-based music systems. It also supports most major computers.

A.L.E.R.T.—A Law Enforcement RoundTable—allows people in law enforcement and related occupations on the local, state, and federal levels to discuss issues facing law enforcement and to exchange ideas more easily. The menu includes a bulletin board for posting messages; periodic Realtime Conferences; law enforcement news; and software libraries, where users can download material such as law enforcement career information, safety tips for latchkey children antifraud tips, home safety information, and safety tips for senior citizens.

Medical RoundTable—for information exchange among physicians, other health professionals, and the interested public. This RoundTable offers 13 data libraries. Two cover AIDS information and are continuously updated. The others cover a broad range of topics including pediatrics, internal medicine, surgery, obstetrics, psychiatry, psychology, medical ethics, history, and software designed for both physicians and the public.

Travel and Leisure Services

Leisure

Genealogy RT—a forum for exchanging genealogical information, whether it is about specific family members, available primary sources, or about other means of gathering or exchanging information.

Scuba RT—gives novice and expert divers a chance to learn more about their sport.

Lienti's Football Forecaster—designed to help users pick winners of professional football games. The information contained in this database enables the user to evaluate the strengths of the offensive and defensive teams.

Science Fiction & Fantasy RT—devoted to discussions of science fiction, fantasy, horror, and other related areas in all their forms. The software library carries episode guides for various series and information relating to fantasy and science fiction.

Spaceport RT—a place for discussions about space, space politics, space pioneering, astronomy, space news, and related activities. Includes news and information directly from NASA and other sources.

Soap Opera Summaries—provides current and past summaries for 12 daytime soap operas and 6 prime-time shows. Updated information on news and gossip within the "soap" industry is also available.

GEnie Banner Maker—for creating text banners to display anywhere.

Hunting and Fishing RoundTable—information concerning hunting and fishing trips in the United States and Canada, and many other areas of interest for both sports. It provides detailed information on U.S. and Canadian hunting and fishing trip planning, including state/province condensed regulations, resident and nonresident license fees, game/fish open seasons, drawing dates, outfitters and guides, bush pilots, custom regulations, resorts/camps, and the latest hunting/fishing equipment.

Aviation RoundTable—for anyone interested in flying and aircraft. The RoundTable offers several aviation categories and topics in the bulletin board area, along with aviation software libraries. Regularly scheduled Realtime Conferences feature guests discussing timely topics.

Radio and Electronics RoundTable—covers electronics and radio hobbies, including amateur radio, shortwave and scanner listening, electronics construction, CB, audio and video, experimentation, and technology advances.

Travel

EAASY SABRE—provides schedules for over 650 airlines worldwide, and more than 13,000,000 fares. Users can also reserve a room at more than 12,000 hotels or arrange for a rental car.

Traveler's Information Services RT—a one-stop travel information service. The RoundTable provides regional travel recommendations and information on how to travel free and get ticket discounts. An on-line travel newsletter is also included.

Adventure Atlas—using this file, users can pick their next trip by using criteria such as type, month, and location. The database responds with several candidate trips that match their criteria.

OAG—a user-friendly service that allows users to view schedules for over 600 airlines and over 37,500 hotels in North America, Europe, and the Pacific.

Shopping Services

GEnie Products—enables users to order various GEnie products, including manuals and back issues of *LiveWIRE Magazine.*

GEnie Classified Ads—an electronic classified ads resource. There is no surcharge to view the ads, though there is a minimal charge to place an ad.

Compu-U-Store Online—allows users to browse or shop for over 250,000 brand name items with discounts ranging from 10 percent to 50 percent off manufacturers' suggested list price.

▷

▷ *GEnie Mall*—one-stop, interactive shopping from over 30 national direct marketers. The list of GEnie Mall vendors includes Apparel Concepts, Carefree Shopping, Crutchfield, Direct Micro, Engraving Connection, Computer Express, Godiva Chocolatier, Investment Software, Long Distance Roses, Music Alley Online, Official Airline Guides, PC-Sig, Software Discounters, Tiffany & Co., and Walter Knoll Florist.

Multiplayer Games

GEnie offers a variety of electronic games, from electronic dogfights to blackjack. Both single players and multiplayer games are available.

OTHER SERVICES

GEnie Software Library

Users may download programs from the GEnie Software Library. During non-prime-time hours, there is no charge for *uploading* software to the library at 300 or 1200 bps. Free uploading does not apply during prime-time hours or at 2400 bps.

Downloading Protocols

In June 1989, GEnie implemented the zmodem downloading protocol within its file libraries. This zmodem protocol joins xmodem, xmodem-1K, ymodem, and ymodem-G. Zmodem, which usually yields a 95 percent efficiency rate, is more efficient than the other protocols available. Zmodem does not need to wait for the PC to acknowledge correct data, which eliminates the largest delay during file transfers.

Communications-Related Services

GEnie offers the following communications-related services:

- **GE Mail:** a full-feature electronic mail service.
- **RoundTable Special Interest Groups:** forums for subscribers to discuss computer hardware and software, as well as other issues.
- **LiveWire CB Simulator:** lets subscribers use terminals to talk to people worldwide. Users can talk to dozens of people simultaneously or "go into private" and talk with just one person.
- **QuikGram:** allows users to send paper mail to anybody in the U.S. from the GEnie system. Deliverable to U.S. addressees only.
- **QuikNews:** a customized clipping service that gathers articles with user-specified keywords from many full-text news sources. The articles are then placed into your GE Mailbox.
- **National Realtime Conference:** suitable for live, interactive electronic meetings, users can reserve a "room" for their next business discussion. An electronic stenographer is available to transcribe the meeting and send the transcript to a GE Mailbox.
- **Locate & Notify:** allows users to locate other users who are on-line and send them messages from most menu pages.

Computer Express Shopping

An on-line shopping service describing more than 300 microcomputer products that may be ordered on-line. The service covers the latest software and accessories for microcomputers from vendors including Commodore, Apple, and IBM.

Gateway to Dow Jones News/Retrieval

Through a gateway arrangement, GEnie subscribers can access Dow Jones News/Retrieval's 40+ business and financial databases. A onetime $35 validation fee, which includes a Dow Jones News/Retrieval manual, applies. The cost for accessing DJN/R's databases from GEnie is $0.41 per minute for non-prime-time access and $1.98 per minute for prime-time access. These prices are for 300, 1200, or 2400 bps access. For additional information on Dow Jones News/Retrieval, including descriptions of the databases it offers, see Report OL20-376-101. □

General Videotex Corporation (GVC) Delphi

COMPANY INFORMATION

General Videotex Corp.
3 Blackstone Street
Cambridge, Massachusetts 02139 (617) 491-3393

UPDATE: *General Videotex Corporation's Delphi service continues to grow; it now has 50,000 subscribers. GVC also launched a new regional service, Delphi/Kansas City, which joins its Delphi/Boston service. GVC is also extending its reach another way—as an information provider to the many Bell Operating Companies (BOCs) that are establishing information gateways.*

Founded in 1980, General Videotex Corporation (GVC) operates the Delphi public on-line information service, regional on-line services, and several private videotex networks. The services are offered to both general and business users.

Delphi has attracted a loyal subscriber base since its 1983 debut. The national on-line service features links to users of other electronic mail systems; telex; translation services; conferencing; groups and clubs; bulletin boards; news, weather, and sports; financial information and services; shopping services; electronic games; and a gateway to DIALOG. Although originally tailored to the home market, Delphi now includes services for business users.

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Other Services **105**

Company Background

Entrepreneur Wes Kussmaul founded General Videotex Corporation (GVC) in 1980 to market his on-line encyclopedia. Three years later, GVC built on the KUSSMAUL encyclopedia by launching the Delphi on-line service (named for the town in ancient Greece where resided a renowned oracle). Today, while Delphi offers networking and electronic shopping services and databases similar to those from such competitors as CompuServe, The Source, and GEnie, it retains its homey, small-town feel.

Delphi was initially targeted to home computer users, but recent enhancements have increased its appeal to business users. A complete travel service, offering airline schedules, fares, and reservations; a business-meeting planner; and Global Venture Network, an international service linking resources that contribute to the growth of new, technology-based business ventures have been added. Other appealing items are sophisticated global electronic mail; conferencing that creates a transcript of on-line conversations; telex services; and translation into and from French, Spanish, German, Portugese, and other languages. Delphi also provides financial news and information, including stock and commodities quotations.

Specifically, Delphi's services include:

- Electronic mail including telex, electronic mail to other information services, and Wordnet translation services
- Conferencing for an unlimited number of groups, each with an unlimited number of participants
- Electronic bulletin boards
- Groups and clubs, each with a different focus, such as type of computer or special interest including computer artwork, theology, and writing
- News and sports from the Associated Press and forecasts from Accu-Weather
- Financial news and information, including home-finance software, stock and commodities quotations, on-line brokerage services, and personal profile analysis
- Travel services including on-line airline, rental car, hotel and cruise reservations, information, and VISA application
- More than 65 on-line databases and gateway access to the more than 300 databases on DIALOG
- Shopping services with sophisticated interactive capabilities

Today, GVC is a professional information company providing state-of-the-art on-line utility services to businesses, associations, and consumers. In addition to operating Delphi, GVC operates Delphi/Boston, an information and communications network tailored to the Boston-area market. A similar service, Delphi/Kansas

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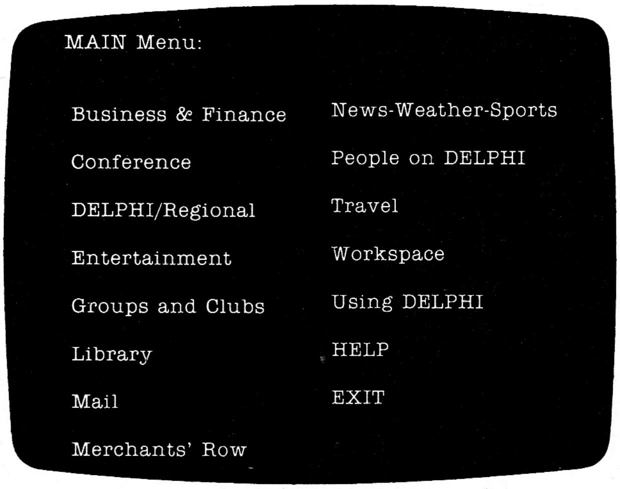


Figure 1. Delphi's main menu.

General Videotex Corporation (GVC) Delphi

City, provides regional on-line services to residents of the Kansas City, Missouri area. GVC also operates private GroupLink networks.

GVC remains committed to the on-line industry and has proven that it is not hesitant to go head-to-head against the other information utilities.

Competitive Position

General Videotex Corporation's (GVC's) primary service, Delphi, competes with CompuServe's CompuServe Information Service; GEnie, an on-line service from General Electric; The Source; and regional videotex services. While Delphi is not the largest service of its kind, it appears to be gaining ground.

Delphi's subscriber base is up to 50,000, according to *Interactivity Report*, an industry newsletter. Although number of subscribers is only one measure of an on-line service's health (actual usage figures are more telling), the 50,000 tally places Delphi in a category with The Source, a much older service. Still, Delphi is a long way from CompuServe's 500,000 subscriber base, or even GEnie's tally of 150,000.

GVC was recognized early on the merit of regional videotex services. Its first such service, Delphi/Boston, is now several years old. Recently, GVC debuted another regional service, Delphi/Kansas City. What's more, these services are spawning services of their own. Delphi/Boston recently introduced a travel service for a Cambridge travel agency. The service cleverly repackages information from Delphi's Travel+Plus service.

What may be even more significant, though, is GVC's participation in the many Bell Operating Company (BOC) information gateways now beginning. For example, it is an information provider to Southwestern Bell's Houston-area gateway, the largest mass market gateway. It also contributes to Bell Atlantic's gateway.

This is an area where GVC's experience in providing regional services is clearly paying off. It is too early to tell just where this will lead the company. But the potential is great, considering the BOC's marketing muscle and deep pockets.

RESOURCES AND FACILITIES

Processing Center

General Videotex Corporation's processing center is located at its Cambridge, Massachusetts facility. The center houses several Digital Equipment superminicomputers. GVC is adding processing power to meet demands.

Customer Support Services

Delphi provides customer ("member") service on-line, as well as through a toll-free number that is staffed daily from 8 a.m. to 1 a.m. Eastern time. Subscribers can also address member service on-line via electronic mail. Member service will answer questions pertaining to Delphi's services or computers in general.

Sales and Marketing Services

All sales are handled out of the company's headquarters in Cambridge, Massachusetts.

PROCESSING SERVICES

Pricing

Delphi charges a onetime sign-up fee of $49.95, which includes the 500-page book, *Delphi: Official Guide*, published by Simon & Shuster; and two hours of free connect time. Delphi Starter Kits, which include a command card and two hours of free connect time, are available through computer dealers for $29.95. Connect time is billed in one-minute increments.

For further information on Delphi's fees and charges, see Table 1 (Page OL20-438-103).

Application-Specific Services

Information Retrieval

Delphi's databases and other services are geared to home and business subscribers. These services are searchable through both menus and keywords.

Electronic Mail

Delphi offers *Delphi Mail*, an electronic mail service that is compatible with virtually any terminal or personal computer. The service provides a hard copy option, including telex.

Fax Capabilities. In addition, members of Delphi's international network can send fax messages (text files or electronic mail) to any Group III fax machine worldwide. Messages may be submitted to single or multiple fax locations; busy or unanswered numbers will automatically be redialed. Other special features include fax number verification, display of charges before sending, page breaks, and on-line help.

Delphi also offers a translation service called Wordnet. This service enables users to have their electronic messages, earmarked for overseas recipients, translated into

General Videotex Corporation (GVC) Delphi

STANDARD *Connect Charges*	Home Time per Minute ($)	Per Hour ($)	Office Time per Minute ($)	Per Hour ($)
DIRECT DIAL (from Boston, Toronto)	0.11	6.60	0.16	9.60
BASIC RATE** (U.S. Mainland and Canada, via Tymnet, Telenet)	0.12	7.20	0.29	17.40
BASIC RATE** (Alaska and Hawaii, via Tymnet)	0.17	10.20	0.34	20.40
BASIC RATE** (Guam and Saipan, via Tymnet)	0.40	24.00	0.40	24.00
BASIC RATE** (Puerto Rico, via Tymnet)	0.30	18.00	0.30	18.00
DATAPAC (Canada)	0.30	18.00	0.30	18.00
INTERNATIONAL*** (other than Canada and Mexico)	0.14	8.40	0.14	8.40
INTERNATIONAL*** (Mexico)	0.47	28.20	0.47	28.20
DELPHI ADVANTAGE *Connect Charges*	**Home Time per Minute ($)**	**Per Hour ($)**	**Office Time per Minute ($)**	**Per Hour ($)**
DIRECT DIAL (from Boston, Toronto)	0.08	4.80	0.14	8.40
BASIC RATE** (U.S. Mainland and Canada, via Tymnet, Telenet)	0.08	4.80	0.27	16.20
BASIC RATE** (Alaska, Hawaii, Guam, and Saipan via Tymnet)	0.15	9.00	0.32	19.20
BASIC RATE** (Puerto Rico, via Tymnet)	0.28	16.80	0.28	16.80
INTERNATIONAL*** (other than Canada and Mexico)	0.12	7.20	0.12	7.20
INTERNATIONAL*** (Mexico)	0.45	27.00 25.00+	0.45	27.00

**As of August 1988.*
***Includes domestic network (Tymnet and Telenet) charges.*
****+International connect charges are exclusive of telecommunications charges, which are billed separately.*

NOTES:

- Entry to the DELPHI Advantage Plan requires payment (onetime) of $19.
- Office time is 7 a.m. to 6 p.m. in the user's local time zone for the continental U.S., Mexico, and Canada. Alaska, Hawaii, and Guam are handled as
- Pacific time.
- Sign-up credits and Delphi Dollars expire six months from sign-up date.
- The following holidays are billed at the home-time rate: New Year's Day, Fourth of July, Labor Day, Thanksgiving, and Christmas Day.
- Charges are applied to members' credit cards two or three times monthly. The end-of-month statement reflects these interim billings.
- Monthly storage charges are as follows: first 25,600 characters (50 blocks) are free. Each additional 1,024 characters (2 blocks) is $0.16. (One block equals 512 characters.)
- Direct-bill accounts carry a $3.50 monthly charge.
- Charges for telex service and certain financial and newsletter services and other surcharges are posted on-line.

Table 1. Delphi's Rates and Prices.*

one or more languages, including French, Spanish, German, Italian, and Portuguese. The translated text can then be returned to its source or forwarded to the recipient via Delphi Mail, telex, or hard copy.

Conference. Delphi can accommodate an unlimited number of on-line, realtime conferences with an unlimited number of participants. Delphi conference participants can retain copies of their on-line conversations.

Poll. This service enables Delphi users to sample the opinions of their colleagues and to vote on issues.

NETWORKING SERVICES

Access to Delphi is available by direct dial in Boston and Toronto and through Tymnet; Telenet; and in Canada, DataPac. Delphi does not charge a premium for 1200 or 2400 baud service.

ON-LINE DATABASES

Delphi provides direct access to more than 65 databases, ranging from airline schedules to zodiacal forecasts, and provides a gateway to DIALOG's 280 files. Descriptions of some of these databases follow.

General Videotex Corporation (GVC) Delphi

AP Videotex Newswire—up-to-the-minute national, international, political, and financial news and sports. The database can be accessed 24 hours daily.

Accu-Weather—detailed three-day forecasts for 15 major U.S. metropolitan areas and three-day temperature-and-condition forecasts for more than 100 major U.S. cities and for more than 100 cities worldwide. The database also includes a general U.S. weather report.

Electronic Games—Delphi offers sports, logic and casino games, electronic versions of board games, and other electronic adventure games.

Movie Reviews—from Cineman Syndicate, brief reviews of current films and films available on videocassettes.

TQ Trivia Quiz—a biweekly quiz on trivial matters.

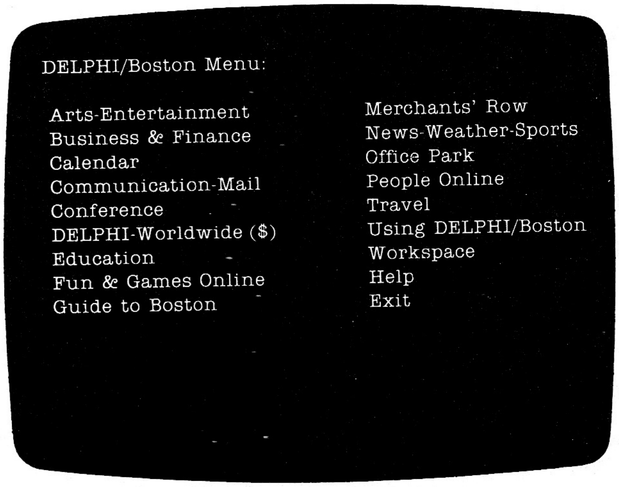
Home Program Library—provides financial programs to calculate returns on investments, mortgage rates, etc.

Naico-Net—a complete on-line brokerage service provided by North American Investment Corporation, Naico-Net gives members access to stock quotations and volume figures and provides transactional services.

Financial and Commodity News—News-a-Tron Market reports, a product of Herman Communications Inc., provides daily analysis of financial and business developments. Among the offerings are metals market prices and analysis; dollar commentary; foreign currency quotes; credit market rates and analysis; world interest rates; an economic calendar; cash grain prices and grain market news and analysis; fuel market prices and news and analysis; stock and commodities prices; and a collection of information on Wall Street activity, including prices, volume, and analysis of the Dow Jones averages, NYSE, AMEX, Value Line, and Standard & Poor's.

Groups and Clubs—these are associations for Delphi users with specific interests. Through these groups, users can access public domain software programs and receive advice as well as general information concerning microcomputers. There are also clubs for people interested in business, theology, model building, computer artwork, science fiction, writing, etc. A list of Delphi's Groups and Clubs follows:

- Amiga
- Apple II and III
- Atari SIG
- Aviation SIG
- Business Forum
- Close Encounters
- Color Computer
- Commodore SIGs
- GameSig
- Hobby Shop
- Macintosh ICONtact
- Micro Artists (MANIAC)
- MSDOS SIG
- Music City
- OS9 On-Line
- PC Compatibles/IBM SIG
- Portable Place
- Science Fiction
- ST Log (Atari ST)
- Tandy Users' Group
- TI International Network
- Theological Network
- VIP-Video & Photo
- Wang Users
- Writers Group



```
DELPHI/Boston Menu:

 Arts-Entertainment           Merchants' Row
 Business & Finance           News-Weather-Sports
 Calendar                     Office Park
 Communication-Mail           People Online
 Conference                   Travel
 DELPHI-Worldwide ($)         Using DELPHI/Boston
 Education                    Workspace
 Fun & Games Online           Help
 Guide to Boston              Exit
```

Figure 2. The main menu from Delphi/Boston, one of two regional services available from Delphi.

Astro-Predictions—horoscopes and personalized astrological forecasts.

Computerized AIDS Information Network (CAIN)—an information network dealing with Acquired Immune Deficiency Syndrome (AIDS). The database includes general information and health agency recommendations for reducing the risk of infection, lists of treatment centers, articles and abstracts from medical journals, and advice on dealing with the social ramifications of the disease.

Healthnet—the latest information on diseases, drugs, home care, symptoms, laboratory tests, and surgeries. Through its Housecalls feature, users can ask questions of the Healthnet staff of board-certified physicians.

KUSSMAUL Encyclopedia—a general reference work containing information on more than 20,000 topics. Users can look up a specific topic; most entries are complete with cross-references and bibliographies.

Shopping Services—Delphi's Merchants' Row lets subscribers browse on-line and then order items for delivery to their homes or offices. Among these services are Antiques and Collectibles, an information network that enables users to buy and sell items; Boston Computer Exchange, which allows users to buy and sell used equip-

General Videotex Corporation (GVC) Delphi

ment; Computer Express, which sells computer software and accessories; and GOLD, which sells computer and office supplies. Delphi also offers access to Comp-U-store. Through this service, subscribers can browse and shop for more than 250,000 brand-name products such as computers, appliances, housewares, stereos, office equipment, tools, VCRs, and luggage, at savings reportedly 50 percent off the manufacturer's suggested retail price.

Travel Services—complete travel information with reservations capabilities.

Official Airline Guide—provides schedules and fares for more than 700 airlines.

OTHER SERVICES

Delphi/Boston

Delphi/Boston is an on-line information and communications network tailored to Boston-area subscribers and accessible via a local phone call. Among its offerings are the State House News Service, which provides gavel-to-gavel coverage of Massachusetts government; extensive interactive services for businesses, groups, and associations; course listings and registration information for Boston-area colleges and universities; and entertainment guides.

Delphi/Kansas City

This is an on-line service tailored to meet the needs of professionals and businesses in Kansas and Missouri. The service includes interactive shopping from local merchants, forums for local clubs and associations, on-line schedules and communications services for radio and television stations, and extensive information about local entertainment and events. The service is available via a local phone call with any terminal or modem-equipped personal computer, for $9.95 per month.

GroupLink

GroupLink is General Videotex Corporation's private wide area networking system that provides associations, corporations, or other distributed user groups with the tools to build their own network. The network can include all of the features and capabilities of the Delphi network and can be reached via a local phone call from over 600 cities in the U.S. and Canada and from cities throughout the world. Delphi charges a onetime fee of $5,000 for establishing a network.

A GroupLink network is completely private and can only be accessed by network members. Network members access the network directly (instead of through the Delphi menu) by using any personal computer or terminal with a modem. Although the network is private, it is operated through GVC's host equipment. Consequently, there is no need to purchase and maintain expensive computer equipment. Network features, menu design, and menu names are all specified by the GroupLink purchaser.

GVC can bill members for their usage. The network owner can charge members a premium above GVC's standard rates. This premium will be collected by GVC and paid to the network owner. □

The H.W. Wilson Company—WILSONLINE

Next to Melvil Dewey's, the name H.W. Wilson might be the one most familiar to librarians. The 90-year-old company publishes 20 indexes, including the widely known *Readers' Guide to Periodical Literature*. In 1984, the company introduced on-line versions of these indexes, through the WILSONLINE on-line information retrieval service. A microcomputer software product, *WILSEARCH*, provides menu-driven access to the *WILSONLINE* databases and enables users to formulate their search strategies off-line. Finally, *WILSONDISC*, a *CD-ROM* retrieval system, provides access to 20 *WILSONLINE* databases on 19 separate compact disks.

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Competitive Position 103
On-Line Databases 107

Company Information

The H.W. Wilson Co.
950 University Avenue
Bronx, New York 10452 (212) 588-8400

UPDATE: *H.W. Wilson's pricing has not changed since our last update, and its database offerings remain the same as well. Its CD-ROM products are now seen as key to its growth, eventually providing more revenue than the company's on-line products. Some components of the company's WILSONLINE Workstation have changed. For example, customers now have a choice between two types of CD-ROM drives.*

Company Background

Halsey William Wilson founded the company that bears his name in 1898. Wilson, then a bookseller, saw an information gap: the lack of a regular listing of new and recent books. This inspired him to create his first reference work: the *Cumulative Book Index*. Spurred on by this success, three years later Wilson unveiled an index that did the same for periodicals, the *Readers' Guide to Periodical Literature.*

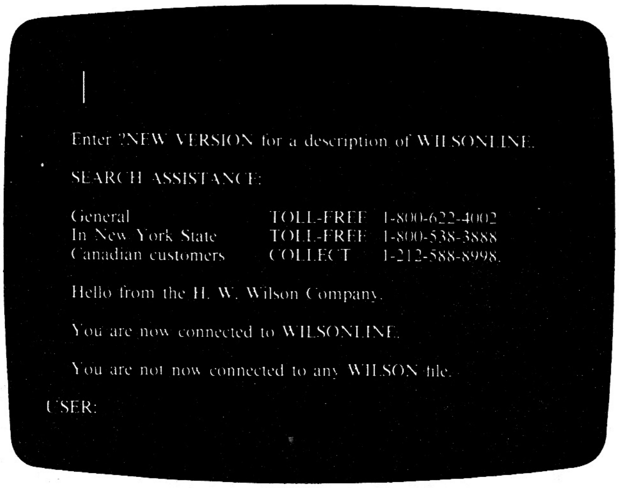
Today, libraries, corporations, schools, universities, government agencies, and institutions worldwide still use these and other Wilson reference works. All told, H.W. Wilson's publications index nearly 3,500 journals, with subject access to over 500,000 articles per year. Over 60,000 monographs annually are covered in its book indexes.

Since 1984, H.W. Wilson has provided on-line access to its indexes through the WILSONLINE on-line information retrieval system. WILSONLINE now includes 26 databases, featuring 23 bibliographic databases and three authority files. The databases provide information about journal articles and reviews, government publications, books and monographs, names of persons, organizations, publishers, and journals.

Unlike most database vendors, H.W. Wilson also produces the databases to which it provides access. Also, its databases are generally not available through other on-line vendors, with the exception of the *Index to Legal Periodicals* database, which is loaded on both Mead Data Central's LEXIS system and West Publishing's Westlaw service. The company believes offering the system itself, rather than going through third-party vendors, offers several advantages. These include:

- Currency—As a database producer, all records are updated in-house, as often as necessary. All Wilson-produced databases are updated at least twice weekly. Wilson claims this currency is unmatched by similar bibliographic retrieval systems.
- Affordability—Because H.W. Wilson vends its own databases, its connect-hour charges are substantially less than those of other vendors' (see Table 1, Page OL20-450-106).
- Flexibility—Citations in bibliographic records or any components are easily and quickly changeable.
- Data control—The Wilson Company is a vertically integrated organization. All indexing, editing, data entry, data processing, photocomposition, printing, binding, storing, and shipping are executed at its New York facility.
- Responsiveness to user needs—As WILSONLINE's vendor, the company receives valuable user feedback on system features and search procedures, as well as on database content.

▷



```
|

    Enter ?NEW VERSION for a description of WILSONLINE.

    SEARCH ASSISTANCE:

    General                TOLL-FREE  1-800-622-4002
    In New York State      TOLL-FREE  1-800-538-3888
    Canadian customers     COLLECT    1-212-588-8998.

    Hello from the H. W. Wilson Company.

    You are now connected to WILSONLINE.

    You are not now connected to any WILSON file.

USER:
```

Figure 1. WILSONLINE's welcome screen, the first screen that appears after logon, is sparse. This is characteristic of command-driven systems. USER:, which appears at the bottom, is WILSONLINE's main prompt.

The H.W. Wilson Company—WILSONLINE

HANDS-ON EVALUATION

Database searchers had to wait until 1984 for H.W. Wilson to put its well-known indexes on-line, but the wait was well worth it. WILSONLINE is a relatively easy-to-use system that's extremely well thought out. This is not to say it's a simple system—far from it. Mastering it could require many search sessions. For the novice user, however, help options abound. And for end users, a personal computer software package, WILSEARCH, eliminates all worries.

Searchers can access WILSONLINE through either the tymnet or telenet telecommunications networks. Through tymnet, for instance, the user types hwwilson (for WILSONLINE) at the "please log in:" prompt. Once connected, the user is prompted to type in "/login", a seemingly needless step. The user then enters his or her WILSONLINE password. Unlike the vast majority of systems we've seen, the user's password is visible—it's not masked.

The welcome screen (Figure 1), which appears next, is sparse. It lists phone numbers for search assistance, a greeting from the vendor, and a notice that the user is not yet connected to a file. At that point, the user is at the main prompt: User:.

Users specify the file they want to search by typing the **File** command, and the three-letter mnemonic for that file, such as RDG for *Readers' Guide to Periodical Literature.* To then start the search, the user can optionally type "find" or "fd" followed by the search term, as in "find homeless"; if a search term is entered without the use of find, however, find is assumed, and the system proceeds with the search. To switch to another file, the user simply types file and the mnemonic for *that* file. That's all there is to simple reference retrieval on WILSONLINE. Many more features, however, are available, and exacting retrieval is possible.

These features include **Proximity searching**—searchers enter "W" to specify that search terms be adjacent; "near" to specify they appear in the same sentence. Full **Boolean logic**, (and, or, not) is supported. Users can search by **field** (such as subject heading) or according to **article type** such as movie review. The **expand** command lets users pull up general and specific headings related to the search term input. For example, as shown in Figure 2, if the user types "expand solar energy" while in the *Readers' Guide Abstracts (RGA)* file, a host of related subject headings appears along with the number of articles to which that heading was assigned. Expand also shows the number of terms related to each subject descriptor in the expand display, and perhaps, most interestingly, the relation of the subject descriptor to the term that's been expanded (BT for broader term; NT for narrower term; RT for related term; etc.). Users can specify that a search strategy be **saved** for later use, via the savesearch feature. A handy complement to this feature lets users customize their searches. That way, they'll only retrieve postings for articles or other references contained in periodicals to which the subscriber has ready access (for example, periodicals contained in the local public or academic library).

WILSONLINE offers two **truncation** symbols: # for single-character truncation (wom#n to retrieve woman or women), and : for multiple-character truncation (libr: for libraries, librarian, library administration, etc.).

While these features are standard in comprehensive on-line systems, WILSONLINE also offers some less common features. The **neighbor** command, for instance, lets the searcher see entries alphabetically above and below search term. For example, we tried this command while in the *RGA* file to pull up references alphabetically close to "database" (Figure 3). As a result, we retrieved some related key words we otherwise might not have thought of, including "database-access," and "databank." Via the **ranging** feature, users can retrieve citations from a given year or according to when they were entered in the database. WILSONLINE also **automatically switches** your search term to the one the particular database uses. For example, if when in the BPI database you instruct the system to search for references on "learning machines," WILSONLINE responds that BPI uses "artificial intelli-

WILSONLINE's development began in the 1970s with the assistance of Logicon, Inc. In addition, Wilson acquired the MEDLARS II search system through a lease from the National Library of Medicine. The software was greatly modified to meet the specific requirements of Wilson's files.

WILSONLINE is a part of the Wilson System, a computerized information system supporting both editorial and manufacturing processes to create the company's subject indexes and catalogs, as well as on-line information retrieval through bibliographic and other databases. The system was designed to provide an efficient means for entering, storing, retrieving, and managing H.W. Wilson's editorial information.

WILSONLINE can be accessed in the U.S., Canada, Europe, Australia, and Asia. Any ASCII terminal or modem-equipped microcomputer can be used to access the system via the Tymnet or Telenet telecommunications networks. The WILSONLINE databases can also be accessed through OCLC LINK and Telebase's EasyNet gateways. In addition, the *Index to Legal Periodicals* database is accessible through LEXIS and Westlaw. Users of these gateways can access WILSONLINE databases using their existing terminals and software.

HANDS-ON EVALUATION (Continued)

gence" instead. It then gives you the number of postings associated with the preferred search term (Figure 4). A handy feature called **Rename** allows the user to change the name for a particular operator during the present search session. A user may change the "and" operator to "&", for example, to make it easier to use and as a keyword (as in find *video tape recoders **and** recording*). Finally, the system allows for **multifile searching**—users can search up to eight files simultaneously.

WILSONLINE's print options are more than adequate for this bibliographic system. After entering a search, the user types "print" or "pr" and the range of records wanted. The default format appears when another is not specified—this gives the title, author, and source for the reference. Other formats available include the short format (sh), which gives merely the title and subject headings; full (fu), which gives all the information available; and catcard, which displays records for books or other monographs in catalog card format. This last option is obviously geared to the library community.

WILSONLINE's high flexibility has its price: its learning curve is fairly steep. Fortunately, the company offers an impressive variety of help options. These include "online explain messages," summoned by typing a question mark plus the acronym for the function in question, such as "?nbr" for information on neighboring (see Figure 5). WILSONLINE also offers toll-free search help; a free 140-page WILSONLINE tutorial, including step-by-step illustrations of search procedures; and a handsomely packaged system manual, the *WILSONLINE Guide and Documentation*. Demonstration diskettes, training videos, and classroom training sessions are available as well.

WILSONLINE'S drawbacks are few. Occasionally, we'd enter a new command only for it to be ignored and the main prompt to appear again. Only after reentering the command would the system respond appropriately. Also, it would help if WILSONLINE made greater use of menus. In the help mode, especially, this would mean less typing for the user. In other areas, it would eliminate some paging through the manuals or memorizing of commands.

To be fair, it's likely H.W. Wilson assumes novice searchers will access WILSONLINE through its WILSEARCH front end. Therefore, searchers accessing the system without the front end (in native mode) will expect a command-driven system, or at least, not be put off by it. Certainly, users familiar with complex systems such as Dialog's, will not mind WILSONLINE's command-driven nature.

Respectivity of the files (how far back they go) is also a minor drawback of the WILSONLINE databases. Most only include references dating back to 1982. Some only go back to 1985. While Wilson has added respective coverage to the *Index to Legal Periodicals* file, this is needed for other files. (For currency, however, WILSONLINE sets a standard for the industry: each database is updated twice weekly.) Finally, when displaying information, the user is limited to 100 lines at a time before needing to hit the enter key. In fact, unless the pagelength is changed, only *25* lines will appear. This limitation is a nuisance when downloading.

All of these "drawbacks" pale in comparison to WILSONLINE's greatest attribute: its price. Because H.W. Wilson is both producer and vendor of its files, there are no intermediary charges. Thus, the Wilson files are a bargain—accessing them costs only $25 to $65 per hour depending on the subscription plan chosen and whether the user subscribes to the print version of the file. These prices compare to a rough industry average of $100 per connect hour.

WILSONLINE impressed us. The abstracts featured in its new *Readers' Guide Abstracts* file are written with uncharacteristic intelligence; it's obvious the abstractors have gone to some trouble to capture the articles' essence. All told, we think WILSONLINE is one of the industry's best bargains.

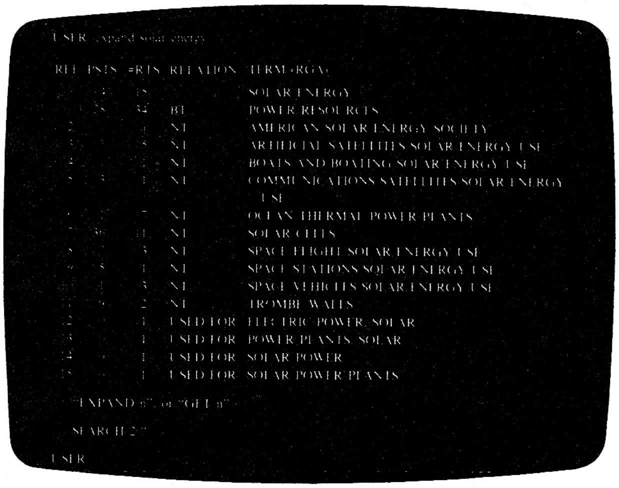
Competitive Position

In the on-line database market, H.W. Wilson competes with DIALOG and BRS. Wilson, whose primary markets are the library and academic communities, now feels that its compact disk business will be much larger than its on-line business. Wilson's target markets remain "uncomfortable with on-line," explained marketing manager Michael Jones. "They have not figured out the fees. Even prepaid subscriptions don't help. The library still has to turn off the machine after the subscription allocation runs out," said Jones. Charging for services, seemingly an option, goes against how libraries usually operate (information is free).

CD-ROM, Wilson has found, is a much more suitable medium for its customers. Unlike on-line charges, it's clear where costs associated with CD-ROM disks and hardware can be charged—to a materials budget. And once the initial expenditures are made, there are no additional costs (no ticking meter). Finally, CD-ROM is generally easier to use than on-line; students and other users can proceed on their own, without the aid of a librarian.

The CD-ROM field, while not as crowded as the on-line field, is still competitive. In this area, Wilson competes with Information Access Company (*Magazine Index* vs Wilson's *Readers Guide to Periodical Literature*) and UMI and EBSCO, both of which have magazine abstracts on disk

The H.W. Wilson Company—WILSONLINE



```
USER: expand solar energy

REF  PSTS  #RTS  RELATION    TERM (RGA)
            15               SOLAR ENERGY
       28   34   BT          POWER RESOURCES
                 NT          AMERICAN SOLAR ENERGY SOCIETY
             8   NT          ARTIFICIAL SATELLITES SOLAR ENERGY USE
                 NT          BOATS AND BOATING SOLAR ENERGY USE
             1   NT          COMMUNICATIONS SATELLITES SOLAR ENERGY
                               USE
             7   NT          OCEAN THERMAL POWER PLANTS
       36   11   NT          SOLAR CELLS
             3   NT          SPACE FLIGHT SOLAR ENERGY USE
             1   NT          SPACE STATIONS SOLAR ENERGY USE
             3   NT          SPACE VEHICLES SOLAR ENERGY USE
             2   NT          TROMBE WALLS
             1   USED FOR    ELECTRIC POWER, SOLAR
             1   USED FOR    POWER PLANTS, SOLAR
             1   USED FOR    SOLAR POWER
             1   USED FOR    SOLAR POWER PLANTS

  "EXPAND n", or "GET n"

  SEARCH 2?

USER:
```

Figure 2. WILSONLINE's expand command enables users to retrieve subject headings related to the one being "expanded." Here, while in the Readers' Guide Abstracts file, we expanded the heading "solar energy" to yield the related headings shown.

(which compete with Wilson's *Readers Guide Abstracts* file). Wilson also considers SilverPlatter a competitor, not because it has competing products, but because both companies are chasing after libraries' dollars.

RESOURCES AND FACILITIES

Processing Center

WILSONLINE databases are maintained in a computerized databank at the company's headquarters (Bronx, New York). WILSONLINE is actually a component of The Wilson System, which performs the following functions:

- on-line data entry;
- on-line text editing of records and data elements;
- automatic validation of bibliographic and authority records;
- automatic mapping of authority information to bibliographic records;
- automatic generation of publication records;
- production of camera-ready computer-photocomposed pages; and
- on-line retrieval (WILSONLINE).

The Wilson System operates on two IBM 4300 mainframe computers and currently uses 26 billion bytes of 3380 magnetic disk storage. There are approximately 230 workstations that comprise the local terminal network, and an additional 30 terminals operate remotely from Wilson's abstracting office in Cambridge, Massachusetts through a 9600 bps leased line. The computer center operates 24 hours a day, 7 days a week; WILSONLINE is accessible throughout these hours.

On-line data entry, text editing, and revision of records are provided by the SCREED (SCREen EDitor) subsystem. The staff uses SCREED to enter bibliographic or authority records, to update or modify records, to browse and display records, or to release batches of citations that have been keyed and edited.

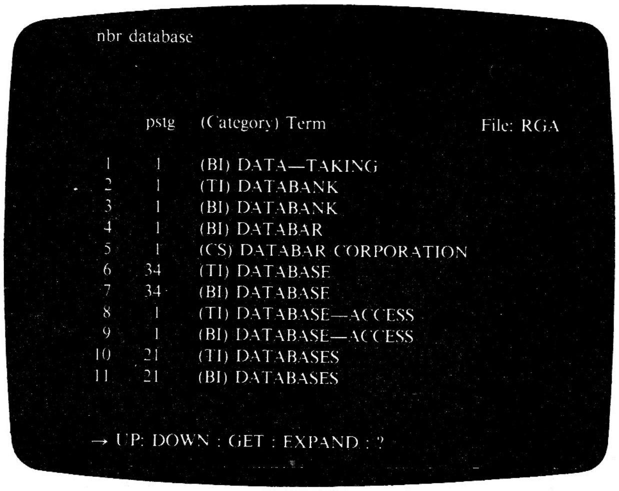
The system automatically validates bibliographic and authority records as soon as they are entered into SCREED. There are four types of validation: *format validation*, which checks for specific data elements and detects typing errors; *content validation*, which verifies whether subject headings have been established for "see also" references and ensures that no blind references exist for "see" references; *near-miss checking*, which alerts the staff that a close match exists for a term in a file; and *duplicate checking*, which determines whether a record has been previously entered.

Information may be mapped into a bibliographic or authority record. This involves the transfer of data from one file to another, based on editorial instructions. Data may be transferred from an authority file to a bibliographic file; for example, birth and death dates of a person are transferred from the Name Authority File to the bibliographic record.

Customer Support Services

Toll-free numbers are available as follows: for WILSONLINE or WILSEARCH queries, (800) 622-4002 (in New York State, call 800/538-3888; in Canada, call collect 212/588-8998). For questions concerning WILSONLINE accounts, users may call (800) 367-6770 (in New York State, call 800/462-6060).

The *WILSONLINE Guide & Documentation* is an in-depth explanation of system commands, search procedures, database summaries, tables, a glossary, and a complete tutorial for self-instruction; WILSEARCH instructions are also included. The *WILSONLINES* newsletter includes information on recent system enhancements and new databases. This free newsletter is published quarterly.



```
nbr database

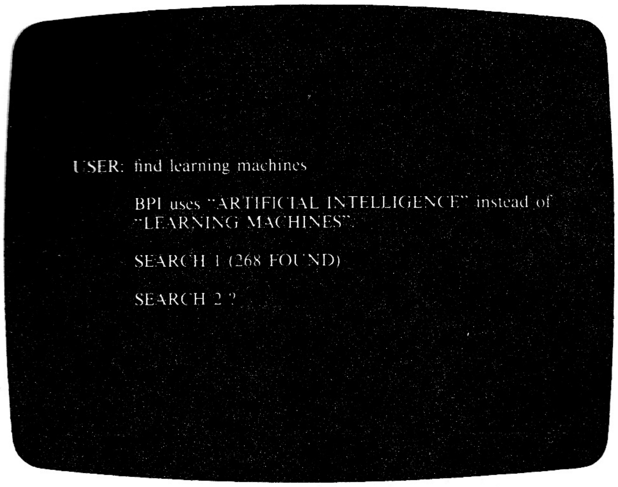
          pstg   (Category) Term                    File: RGA

    1       1    (BI) DATA—TAKING
    2       1    (TI) DATABANK
    3       1    (BI) DATABANK
    4       1    (BI) DATABAR
    5       1    (CS) DATABAR CORPORATION
    6      34    (TI) DATABASE
    7      34    (BI) DATABASE
    8       1    (TI) DATABASE—ACCESS
    9       1    (BI) DATABASE—ACCESS
   10      21    (TI) DATABASES
   11      21    (BI) DATABASES

  → UP: DOWN : GET : EXPAND : ?
```

Figure 3. WILSONLINE's neighbor command lets the searcher see entries alphabetically above and below a given search term. Here, we asked the system to display references alphabetically close to "database."

The H.W. Wilson Company—WILSONLINE



```
USER: find learning machines

      BPI uses "ARTIFICIAL INTELLIGENCE" instead of
      "LEARNING MACHINES".

      SEARCH 1 (268 FOUND)

      SEARCH 2 ?
```

Figure 4. "Automatic switching" to preferred headings is a WILSONLINE bonus. The system electronically substitutes the Wilson subject heading for all "see" references used in the printed index, then searches and provides postings automatically.

WILSONLINE Training Seminars and Subject Seminars are held regularly at the company's permanent training site in New York City. In addition, one-day WILSONLINE Training Seminars are scheduled throughout the U.S. and Canada. Two free hours of search time following a full-day Training Seminar are offered, in addition to free WILSONLINE Tutorials and other publications. A one-day Training Seminar is $60 per person, or $75 per person, including one copy of the *WILSONLINE Guide & Documentation*. Customized Training Seminars are also available for groups of 10 persons or more, for a fee of $600.

An instructional videotape, *Online Searching: An Introduction to WILSONLINE*, is available. The videotape combines coverage of on-line searching's potential with a look at specific WILSONLINE commands and features. It is priced at $89 (U.S. and Canada).

H.W. Wilson offers a special WILSONLINE Training Package, priced at $159, which includes the following:

- A full-day training seminar and two free hours of WILSONLINE search time;
- The *WILSONLINE Guide & Documentation*;
- The WILSONLINE Quick Reference Guide;
- The WILSONLINE Tutorial;
- The Online Searching video;
- The WILSEARCH Demonstration Diskette;
- The WILSEARCH Guide; and
- The WILSEARCH Quick Reference Card.

If purchased without the full-day WILSONLINE Training Seminar, the package price is $119.

Sales and Marketing Services

H.W. Wilson publications, WILSONLINE, and WILSEARCH are marketed directly to users. WILSONLINE is marketed nationwide through direct sales, conferences, print advertising, direct mail, and telemarketing. WILSONLINE is also available to users through OCLC's LINK and Telebase's EasyNet gateways.

PROCESSING SERVICES

Pricing

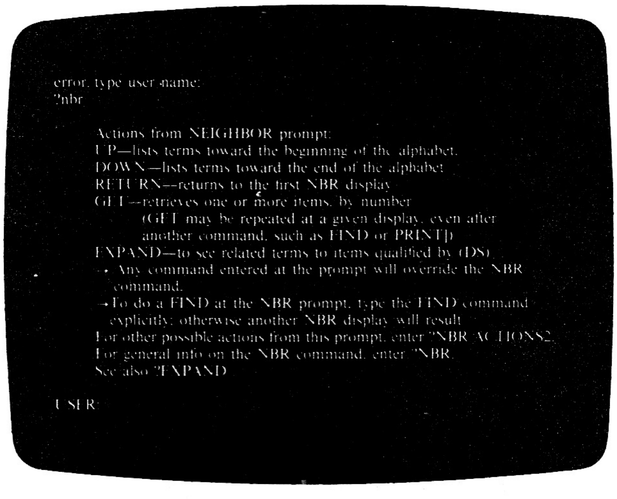
WILSONLINE users are not charged a sign-up fee. There are no additional royalty charges added to the connect-time hourly rates as shown in Table 1. There is no charge for on-line prints on WILSONLINE; off-line prints are $0.20 per citation, with a $10.00 minimum for prints ordered in a single 24-hour period. WILSONLINE is accessible through Tymnet or Telenet at the rate of $10 per hour, in addition to the hourly connect-time charges. *There is no surcharge for 1200 or 2400 bps access.* Also, there is no charge for "Saved Searches" and no monthly minimum usage stipulations. Users are charged monthly for hours searched on WILSONLINE.

As shown in Table 1, users may subscribe to WILSONLINE and have a deposit account, prepaying $300 to $2,400 in advance, which entitles them to discounts in online charges (see sections one and two). For those not wishing to prepay, the pay-as-you-go rates (sections three and four) apply. In either case, subscribers to the print equivalents of a searched database receive discounts on the online connect-time charges.

MICROCOMPUTER/SOFTWARE SERVICES

WILSEARCH

In 1985, the H.W. Wilson Company introduced a personal computer software package, WILSEARCH, for novice online searchers, students, or library patrons. With a menu



```
error, type user name:
?nbr

        Actions from NEIGHBOR prompt:
        UP—lists terms toward the beginning of the alphabet.
        DOWN—lists terms toward the end of the alphabet
        RETURN—returns to the first NBR display
        GET—retrieves one or more items, by number
             (GET may be repeated at a given display, even after
             another command, such as FIND or PRINT)
        EXPAND—to see related terms to items qualified by (DS)
        → Any command entered at the prompt will override the NBR
          command.
        →To do a FIND at the NBR prompt, type the FIND command
          explicitly; otherwise another NBR display will result
        For other possible actions from this prompt, enter ?NBR ACTIONS2.
        For general info on the NBR command, enter ?NBR.
        See also ?EXPAND

USER:
```

Figure 5. One of the many ways a WILSONLINE user can get help is through the system's "on-line explain messages." These are summoned by typing a question mark plus the acronym for the function in question. Here we've pulled up information on WILSONLINE's neighboring feature.

The H.W. Wilson Company—WILSONLINE

ANNUAL SUBSCRIPTION RATES Charges for the hours searched on WILSONLINE, and other charges will be applied monthly to the amount prepaid.	Section 1 Subscribers to both WILSONLINE and the printed index searched				Section 2 Subscribers to WILSONLINE only				Section 3 Subscribers only to the printed index searched	Section 4 Nonsubscribers to either WILSONLINE or the printed index searched
	Annual Subscription Rates				Annual Subscription Rates					
	A	B	C	D	A	B	C	D		
	$300	$600	$1200	$2400	$300	$600	$1200	$2400		
DATABASES	Hourly Connect-Time Rates				Hourly Connect-Time Rates				Hourly Connect-Time Rates	
Applied Science & Technology Index	$50	$48	$46	$43	$60	$55	$52	$50	$55	$65
Art Index	50	48	46	43	60	55	52	50	55	65
Bibliographic Index	50	48	46	43	60	55	52	50	55	65
Biography Index	32	30	28	25	40	35	34	32	35	45
Biological & Agricultural Index	50	48	46	43	60	55	52	50	55	65
Book Review Digest	32	30	28	25	40	35	34	32	35	45
Business Periodicals Index	50	48	46	43	60	55	52	50	55	65
Cumulative Book Index	41	39	37	34	50	45	43	41	45	55
Education Index	32	30	28	25	40	35	34	32	35	45
Essay and General Literature Index	41	39	37	34	50	45	43	41	45	55
General Science Index	41	39	37	34	50	45	43	41	45	55
GPO Monthly Catalog	—	—	—	—	40	35	34	32	—	45
Humanities Index	41	39	37	34	50	45	43	41	45	55
Index to Legal Periodicals	50	48	46	43	60	55	52	50	55	65
Index to U.S. Government Periodicals	—	—	—	—	60	55	52	50	—	65
LC/Foreign MARC File	—	—	—	—	40	35	34	32	—	45
LC/MARC File	—	—	—	—	40	35	34	32	—	45
Library Literature	32	30	28	25	40	35	34	32	35	45
MLA International Bibliography	—	—	—	—	60	55	52	50	—	65
Readers' Guide Abstracts	50	48	46	43	60	55	52	50	55	65
Readers' Guide to Periodical Literature	32	30	28	25	40	35	34	32	35	45
Social Sciences Index	41	39	37	34	50	45	43	41	45	55
Vertical File Index	32	30	28	25	40	35	34	32	35	45
Wilson Journal Directory	—	—	—	—	40	35	34	32	—	45
Wilson Name Authority	—	—	—	—	60	55	52	50	—	65
Wilson Publishers Directory	—	—	—	—	40	35	34	32	—	45

Other WILSONLINE Services and Charges	
Abstracts (from *Readers' Guide abstracts*)	$0.50 each, includes citation (on-line or off-line print)
Account Start-up	No Charge
Educational Rates	Available for instructional use. Please write for details.
Extracts (from *Book Review Digest*)	$0.75 each complete record, includes citation (on-line or off-line print)
Multifile Searches	Each database billed separately.
Newsfile Access Charge (Default file)	$10.00 per hour
Off-line Prints	$0.20 per citation $10.00 minimum per day; mailed within 24 hours (for abstracts and extracts, see above)
On-line Prints	$0.10 per citation (for abstracts and extracts, see above)
Password	No Charge
Telecommunications Fee	
Telenet	$10.00 per hour
Tymnet	$10.00 per hour
(also accessible via OCLC Link, Telebase/Easynet, and DataPac)	
Saved Searches	No Charge

Toll-Free Number for Orders and Service
1-800-367-6770
In New York State, call 1-800-462-6060;
In Canada, call collect 212-588-8400.

Table 1. Rate schedule for H.W. Wilson's WILSONLINE on-line information services, effective January 1989.

calling for simple user responses, WILSEARCH formulates searches automatically and provides on-line retrieval from any of the 3,500 periodicals and 60,000 books indexed and cataloged annually in the Wilson databases (the same data available through WILSONLINE). WILSEARCH requires no search experience or special training. All search instructions appear on the screen for each step of the search procedure, such as:

- Overview and database descriptions that explain what data is available and how to access it;
- Menu of general subject areas;
- Database menu to select any two databases to search simultaneously;
- HELP windows and commands; and
- Additional, related terms provided when search completed.

An order for WILSEARCH software includes a license to use the WILSEARCH diskette. The 12-month license costs $150. A sliding scale for multiple diskettes is available at reduced rates. The licensing fee entitles the user to updated diskettes as new system features are introduced. A copy-protected WILSEARCH diskette is provided, as well as a backup diskette, the WILSEARCH Guide, and other related publications. Instead of connect-hour charges, users are charged for each search conducted with WILSEARCH software, regardless of the database being accessed. A search is defined as delivery of 10 references during any one WILSEARCH logon. If no references are found, there is no charge. The search fees are based on the prepayment option chosen. With a prepayment subscription level of $2,000, each WILSEARCH search costs $1; if no prepayment is made, users are charged $5 per search.

There are no telecommunications costs, database royalty fees, or other charges associated with using WILSEARCH, aside from a per-search fee and the diskette license fee. WILSEARCH can be used on all IBM-compatible and Apple IIe computers.

A special WILSEARCH feature allows direct access to WILSONLINE for users with WILSONLINE accounts.

NETWORKING SERVICES

WILSONLINE databases are accessible via the Tymnet, Telenet, and Datapac (Canada) telecommunications networks. Each network is accessible via a local telephone number in most U.S. cities, as well as Canada, Australia, and Europe.

ON-LINE DATABASES

The following features apply to WILSONLINE databases:

- Multifile searching—users may search up to eight separate WILSONLINE files simultaneously.
- Automatic switching of subject headings—Wilson subject headings with "see" references used in the printed index are found on-line (see Figure 4).

The H.W. Wilson Company—WILSONLINE

- Free text searching as well as controlled vocabulary searching—users may search for individual words using Boolean operators or proximity searching or may use controlled subject headings, found in the printed indexes.
- On-line thesaurus of subject headings—includes broader terms, narrower terms, and related terms, as well as cross-reference structure; postings are provided.
- Neighboring (browsing)—offers a display of terms alphabetically related to the word being searched.
- Truncation—facilitates searching for all terms derived from a specific term or root; hatch marks (#) substitute for single letters or spaces; the colon (:) substitutes for multiple characters or spaces.
- Ranging—users can limit their search to a specific range or span of dates, covering only the publication period desired.
- Boolean operators—AND, OR, NOT are used to narrow searches; may be nested.
- Proximity searching—further refines searches.
- Rename—allows searchers to substitute their own terminology for WILSONLINE commands.
- Save/Savesearch—searches may be saved, or users may store a profile to be rerun without repeating the search procedure.
- On-line and off-line sorting—to arrange results of the search by a variety of options.
- Off-line printing.
- On-line HELP and EXPLAIN messages.
- On-line charge report—type COST.
- Article content codes—permits users to limit search results by type of article desired.

In addition to the following brief descriptions, most of the WILSONLINE databases correspond to the Wilson print publications. These databases are profiled in detail in the OL40 section of this publication.

Applied Science & Technology Index—citations to articles, book reviews, interviews, new product reviews, and selected editorials and letters to the editor from 336 English-language publications in the applied sciences and technology.

Art Index—citations to articles and book reviews from approximately 200 foreign and domestic periodicals, yearbooks, and museum bulletins. The database also extensively covers art reproductions.

Bibliographic Index—citations to bibliographies published in English and other languages on a wide variety of subjects. The database covers both bibliographies that are published separately as books and pamphlets and those that appear in other publications.

Biography Index—citations to biographical information available in books and periodicals. Sources include current books of biography, autobiography, critical studies, and biographical fiction; about 2,600 periodicals; newspaper obituaries; bibliographies; and other printed material.

Biological & Agricultural Index—citations to articles, book reviews, symposia and conference papers, and selected letters to the editor from over 200 English-language periodicals on biology and agriculture.

Book Review Digest—citations, each with excerpts, to current reviews of English-language books. The database covers popular and scholarly works of fiction and nonfiction, as well as juvenile literature.

Business Periodicals Index—citations to articles and book reviews from over 300 business periodicals. The database includes feature articles; interviews; biographical sketches of business leaders; book reviews; research developments; new product reviews; and reports of associations, societies, and conferences.

Cumulative Book Index—bibliographic records for English-language books published worldwide. The database also covers books (about 60,000 annually) that are partially in English, including dictionaries, phrase books, and other aids to language learning.

Education Index—citations to articles, interviews, selected editorials and letters to the editor, and reviews of books, educational films, and software from approximately 350 English-language periodicals, monographs, and yearbooks in the field of education.

Essay and General Literature Index—indexes essay collections and anthologies published in English with emphasis on the humanities and social sciences. The database covers a wide range of subject areas, including criticism of literary works, drama, film, and bibliographies.

General Science Index—citations to articles and book reviews from over 111 English-language periodicals in the sciences.

Humanities Index—citations to articles and book reviews from about 350 periodicals in the humanities.

Index to Legal Periodicals—citations to significant articles from over 475 legal periodicals, including journals, yearbooks, annual institutes, bar association organs, university publications, law reviews, government publications, and book reviews. The database covers recent court decisions, new legislation, precedents, and specific types of law.

Index to U.S. Government Periodicals—offers subject access to information from 185 periodicals issued by more than 100 U.S. government agencies and departments. This database is produced by Infordata International Inc.

LC Foreign MARC Database—offers complete bibliographic records of books published in most foreign languages, including Danish, Dutch, French, German, Italian, Norwegian, Polish, Portuguese, Romanian, Spanish, and Swedish.

The H.W. Wilson Company—WILSONLINE

▷ *LC MARC Database*—contains bibliographic information on monographs, including all major elements for the Library of Congress catalog, along with MARC tags, indicators, and subfield codes for each element.

Library Literature—citations to books and articles on library and information science and to reviews of relevant books, periodicals, and audiovisual materials, from about 200 periodicals and 600 monographs.

MLA International Bibliography—published by the Modern Language Association of America, MLA contains citations to current scholarship of language, linguistics, literatures, and folklore from over 3,000 journals and monographs. It includes natural languages and invented languages that exhibit the characteristics of human languages, such as sign language, Esperanto, and computer programming languages.

Readers' Guide Abstracts—summaries of up to 150 words for each periodical article indexed in *Readers' Guide to Periodical Literature*, with the exception of book reviews and creative writing works.

Readers' Guide to Periodical Literature—citations to articles of at least one column in length from more than 195 general-interest and popular magazines.

Social Sciences Index—citations to articles and book reviews from more than 353 English-language periodicals in the social sciences. SSI provides extensive coverage of current events.

United States Government Printing Office Monthly Catalog—provides access to publications generated by a wide range of federal government agencies, including reports, studies, fact sheets, handbooks, conference proceedings, etc.

Vertical File Index—annotations and citations to printed nonbook materials of general interest, including charts and posters, booklets, pamphlets, museum catalogs, exhibition bulletins, and government and university publications.

H.W. Wilson Journal Authority File—information on more than 2,800 periodicals cited in databases and publications of The H.W. Wilson Company.

H.W. Wilson Name Authority File—references to the preferred forms of personal names, corporate names, and selected publication titles as they are controlled in databases and publications of The H.W. Wilson Company.

H.W. Wilson Publisher Authority File—information on about 14,000 publishers cited in *Cumulative Book Index and Book Review Digest.*

OTHER PROFESSIONAL SERVICES

WILSONDISC—CD-ROM Retrieval System

The H.W. Wilson Company now offers a compact disk-read-only memory (CD-ROM) search system, WILSONDISC. Bibliographic data and abstracts are searchable by means of an optical disk reader connected to a microcomputer. Twenty databases are available on 19 separate compact disks. Updated quarterly, WILSONDISC includes unlimited access to the on-line system, WILSONLINE, as part of the disk subscription price. This enables users to retrieve the most current information. Three search modes are tailored to different levels of search experience, permitting novices and experienced users to choose an appropriate search method.

WILSONLINE Workstation

The Wilson Company distributes IBM PCs and peripheral equipment and offers a workstation for on-line and CD-ROM search needs. The WILSONLINE workstation components listed below can be used for all services in the WILSONLINE Information System—WILSONLINE, WILSEARCH, and WILSONDISC:

- IBM Personal System/2 Model 30-286 with 640K bytes of memory, 20M-byte internal fixed disk drive, and 720K-byte diskette drive
- IBM Personal System/2 Color Display 8512 monitor
- Color monitor adapter
- Hewlett-Packard ThinkJet printer and cable
- DOS 3.3 Operating System
- Hayes 1200B modem
- Philips CM 121 or Hitachi 1500 CD player
- WILSONDISC demonstration disk

On-site installation, training, and a year of IBM on-site maintenance or component replacement are included in the price of a complete workstation. ☐

Info Globe

COMPANY INFORMATION

Info Globe
444 Front Street West
Toronto, ON Canada M5V 2S9
Telephone (416) 585-5250

Company Background

Info Globe is the electronic publishing division of *The Globe and Mail*, Canada's national newspaper. Formed in 1979 to market *The Globe and Mail Online*, Info Globe now has more than 10,000 users, mostly in Canada and the United States. These include corporations, government departments, schools, universities, public libraries, law firms, banks, and investment firms. Investors use Info Globe's stock analysis software and Marketscan, a stock database.

Info Globe now markets 16 databases, both textual and numeric. In October 1986, Info Globe became a print publisher when it acquired *The Canadian Periodical Index*. In December 1988, Info Globe acquired the *Canadian Parliamentary Guide*, which it plans to market in both print and electronic forms. Info Globe's software packages make use of the company information available in its financial databases.

Info Globe acts as the Canadian marketing agent for other on-line services, including Dow Jones News/Retrieval, Profile, and Bechtel Information Services. It also markets a microfilm version of *The Globe and Mail.*

Info Globe employs approximately 50 full-time staff members to create, market, and support its products. A number of temporary and part-time employees are also used, particularly during the period when annual company information is collected and entered.

Competitive Position

Info Globe feels it has no direct competition because many of the databases it offers are not available through any other vendor. When pressed, however, Info Globe reports that Infomart, marketer of many regional databases, and FP Online, which markets the electronic version of the *Financial Post*, offer some competition.

The company's big draw remains *The Globe and Mail Online*; Info Globe is the only source for this database. Canada's newspaper of record, *The Globe* has been called a cross between *The New York Times* and *The Wall Street Journal*. Another popular file is *Marketscan*, an on-line stock market service that private investors use extensively.

Founded in 1979, Info Globe is the electronic publishing division of Canada's national newspaper, *The Globe and Mail*. Offering a mix of textual and numeric databases, Info Globe specializes in providing access to Canadian information. It also offers a CD-ROM product, *The Globe and Mail 1985*, software packages for use with its financial databases, and a print index, *The Canadian Periodical Index*.

REPORT HIGHLIGHTS: PAGE
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On-Line Databases 102

Currently, Info Globe has approximately 10,000 subscribers and reports adding more and more multiple accounts. Info Globe feels it can expect continued growth because Canada's on-line market is not as mature as the U.S. market.

RESOURCES AND FACILITIES

Processing Centers

Info Globe uses the facilities of STM Systems Corp., Canada's leading time-sharing service bureau. The databases run on Amdahl and IBM mainframe computers.

Sales and Marketing Services

Info Globe markets through its Toronto headquarters and regional sales offices in Vancouver, Montreal, and Ottawa.

The Exchange

Info Globe is a leading vendor of Canadian company and general interest information. Two of its major information sources—the Toronto Stock Exchange and The Globe and Mail newspaper (represented by the vending box, far left)—are shown here.

Info Globe

Info Globe conducts training sessions across Canada and the U.S. and offers a training database for practicing search techniques. The company's Training and Information Service staff is available to answer questions during business hours, Monday through Friday. A toll-free number, (800) 268-9128, is available in Canada. (In Ontario, the number is 800/268-8043.)

Pricing

Info Globe has two basic subscription plans—the News Package and the Financial Package. In addition, users can subscribe to its *Marketscan*, *Key Government Documents*, and *Personal Search* databases directly. For additional pricing information, see Table 1.

NETWORKING SERVICES

Info Globe's databases are available on a dial-up basis through the Datapac network in Canada and through Telenet and Tymnet in the U.S. The system is available 22 hours a day, 7 days a week (including holidays).

MICROCOMPUTER SOFTWARE/ SERVICES

Info Globe offers several software packages that enable users to perform sophisticated investment analyses, incorporating data from relevant Info Globe databases. For example, the company's *Link 1000* package enables users to download key reporting items on companies from *The Canadian Financial Database* directly into spreadsheet programs including Lotus 1-2-3.

Info Globe's software packages are designed to run on the IBM PC and compatibles and Apple Macintosh personal computers.

ON-LINE DATABASES

Info Globe offers both textual and numeric databases. Its News Package databases contain textual files, many of which are full text. All of its financial databases are numeric.

News Databases

Canada News-Wire—Canada's largest and most widely used news release service. It carries releases for more than 3,000 organizations.

Canadian Books in Print—contains more than 28,000 entries from Canadian publishers. The database producer has made an effort to include all titles bearing a Canadian publisher imprint or originating from the Canadian subsidiaries of international publishing firms. The database is updated quarterly.

The Canadian Index of Computer Literature—an index to articles appearing in approximately 30 Canadian computer-related publications. Information from September 1985 to the present is available.

Canadian Lawyer—the full text of *Canadian Lawyer Magazine*, from October 1987 onward.

The Canadian Periodical Index—the on-line edition of the monthly index founded in 1924. The database indexes more than 350 periodicals. Updated weekly, the file's coverage extends back to 1977.

Canadian Trademarks—contains complete information on all Canadian trademarks, both registered and pending. Information for the database is compiled by the Trademarks Branch of Consumer and Corporate Affairs Canada.

Canadian Who's Who—contains more than 9,000 biographical sketches of Canadian business executives. The entries are derived from *Who's Who in Canadian Business* and *Who's Who in Finance*.

Computing Canada and *Computer Dealer News*—the full text of these two publications. *Computing Canada* is published biweekly on Thursdays, and *Computer Dealer News* is published semimonthly.

Corporate Canada Online—combines material from several Info Globe databases on more than 2,000 Canadian companies. The file includes stock quotes from *Marketscan*, news articles from *The Globe and Mail*, income statements and balance sheets from the *Report on Business Corporate Database*, and details on officers and directors from the *Canadian Financial Database*. The database is searchable via company name or stock symbol.

The Globe and Mail Online—contains the full text of articles from *The Globe and Mail*, Canada's national newspaper. Virtually all articles are included—news, business, sports, entertainment—plus selected advertising. The database begins with the November 14, 1977 issue and is updated, daily, by 5 a.m.

Key Government Documents Database—includes the full text of press releases from Canada's Department of Finance, Revenue Canada, and other sources. The information is made available minutes after its release.

The Northern Miner—the full text of Canada's mineral resources newspaper. This full-text database, which extends back to September 1986, covers companies, people, and issues in Canada's mining industry.

Orders in Council—brief descriptions of executive or legislative orders determined by the Canadian Cabinet during its weekly meetings. The full text can be ordered from the Privy Council Office. Updated weekly, the database is available to all Key Government Documents subscribers.

Personal Search—a menu-driven database providing the full text of nonbusiness-related articles from *The Globe and Mail.*

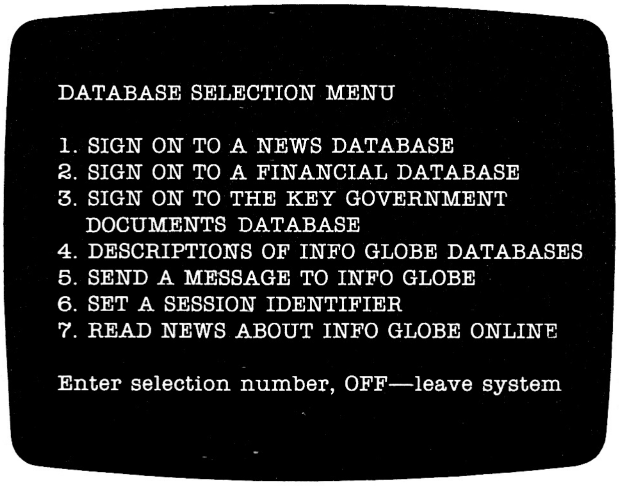
Reportline—a one-stop source of financial data and market information on TSE 300 companies. The database provides summary income statement and balance sheets for the past three years, per share data, growth rates, financial ratios, and recent news. It can be searched by ticker symbol or company name.

Financial Databases

The Canadian Financial Database—provides the full text of financial statements from major Canadian publicly held corporations and crown corporations competing in the private sector.

Marketscan—an on-line stock market service delivering daily closing information from the Toronto, Montreal, Alberta, Vancouver, New York, and American stock exchanges.

Report on Business Corporate Database—detailed corporate data on more than 1,750 Canadian companies, including all active public companies traded on all Canadian stock exchanges. The database provides information on more than 300 financial items going back 10 years. Users can also search and screen quarterly information for more than 350 major corporations.



```
DATABASE SELECTION MENU

1. SIGN ON TO A NEWS DATABASE
2. SIGN ON TO A FINANCIAL DATABASE
3. SIGN ON TO THE KEY GOVERNMENT
   DOCUMENTS DATABASE
4. DESCRIPTIONS OF INFO GLOBE DATABASES
5. SEND A MESSAGE TO INFO GLOBE
6. SET A SESSION IDENTIFIER
7. READ NEWS ABOUT INFO GLOBE ONLINE

Enter selection number, OFF—leave system
```

Figure 1. Info Globe's "Database Selection Menu," the first menu to appear after logon.

OTHER SERVICES

Info Globe is a Canadian marketing agent for Dow Jones News/Retrieval, Profile, and Bechtel Information Services. Info Globe provides marketing, training, and customer service for these vendors. *Corporate Canada Online* is available to Dow Jones News/Retrieval subscribers through a gateway.

FUTURE PLANS

Info Globe reports that it is constantly developing new products and acquiring the rights to new databases. Its current plans include a database of bond prices, a new financial product, and some new text databases. Also, Info Globe expects to announce several new gateway agreements in 1989.

Info Globe

TABLE 1. INFO GLOBE'S PRICE SCHEDULE AS OF APRIL 1989

Price Schedule

THE NEWS PACKAGE

Initiation Fee	$379.00

Includes manual and password for the following databases, 2 free connect hours* and 150 displays on The Globe and Mail Online *only*, in the first month.

Usage Fees

The Globe and Mail/Northern Miner/Computing Canada Online

Connect fee (per minute)	$3.30
Document fee (per article)	$0.30
Offline prints (per line) (Globe and Mail only)	$0.03

Canadian Periodical Index &
Canadian Index of Computer Literature Online

Connect fee (per minute)	$3.30

Personal Search
See rates below

Canadian Who's Who/Canada News-Wire/Trade Marks/Canadian Books in Print

Connect fee (per minute)	$3.30

Individual Database Products

Corporate Canada Online (includes 30 minutes free time*)

Initiation fee	$79.00
Connect fee (per minute, prime time)	$3.30
Connect fee (per minute, non-prime time)	$1.75

Marketscan (includes 30 minutes free time* and 5,000 data lines)

Initiation fee	$85.00
Connect fee (per minute, prime time)	$3.00
Connect fee (per minute, non-prime time)	$0.60
Data lines (includes High, Low, Close, and Volume)	$0.02

Personal Search (includes 60 minutes free time*)

Initiation fee	$49.95
Connect fee (per minute, prime time)	$2.25
Connect fee (per minute, non-prime time)	$0.60

The Key Government Documents Database (includes Status of Bills, Trade Marks, and Orders in Council)

Annual fee	$50.00
Connect fee (per minute, prime time)	$3.30
Connect fee (per minute, non-prime time)	$0.60

Info Globe's main sign-on screens and *The Globe and Mail Training Database* are both available at $0.50 per connect minute.

*Communications fees are billed during free time.

Telecom Canada's communications fee of $0.21 per minute is passed through and billed to the user on all of the preceding databases. Prime time is from 8 a.m. to 8 p.m. Eastern.

THE FINANCIAL PACKAGE

Initiation Fee	$379.00

Includes manual, password, and a free half hour* on each of following databases, in the first month.

Usage Fees

The Canadian Financial Database

Connect fee (per minute)	$4.35
Key items (each)	$0.10
Offline prints (per line)	$0.03

The Report on Business Corporate Database

Connect fee (per minute)	$2.75
Data items (each)	$0.11

Reportline

Connect fee (per minute, prime time)	$3.30
Connect fee (per minute, non-prime time)	$1.75

Marketscan Corporate Canada Online Personal Search
See rates on reverse

*Maximum 5,000 Marketscan data lines and 1,500 ROB data items. Communication fees are billed during free time.

Telecom Canada's communications fee of $0.21 per minute is passed through and billed to the user on all of the preceding databases.

Third-Party Database Products

Dow Jones News/Retrieval

Initiation fee	$100.00

There are more than 40 individual databases included with your initial fee. Prices per minute range as follows:

Non-prime (min)—Prime time (max)	$1.76-3.46
2400 baud character charge (1,000 units)	$0.09-0.39

DJN/R non-prime time begins at 6:01 p.m. local time. Some databases (e.g., Disclosure, Investext, Tradeline) carry fees in addition to above. Details are available online.

Profile Information (Financial Times of London)

Initiation fee	$150.00
Connect fee (per minute)	$3.20

Global Report (includes 8 minutes/month free time)

Monthly fee	$25.00
Connect fee (per minute)	$3.00

Custom Searches

If you do not have equipment, or you would prefer to have us do your searches, call our Search Service in Toronto. We can access sources not listed above including *The New York Times*. Results are available the next business day at an average cost of $75-$100.

User Training

Info Globe offers full- and half-day workshops across Canada and the U.S. Call us or see our subscriber newsletter for the latest schedule.

INFLO GLOBE, 444 Front Street West, Toronto, ON M5V 2S9
(416) 585-5250

Interactive Data Corporation

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Synopsis

Editor's Note

There have been minor changes to Interactive Data Corporation (IDC) and its services since our last update. The vendor still serves the financial industry and targets specific market tiers, but it no longer operates its International Division that focused on the European and Far Eastern markets. It now concentrates on Eastern Canada and the United States. IDC's clients, which include both individual and institutional investors, use its financial information for complex planning and analysis systems. IDC has added two new Portfolio Services to its software environment, but at the same time it has deleted two services. The securities pricing services, notification services, fund evaluation services, and estate evaluation services offered through its subsidiary, Interactive Data Services, Inc., are now available through IDC itself.

Report Highlights

IDC deleted two services but replaced them with *PASSPORT* and *InterPort*. *PASSPORT*, a micro-to-mainframe portfolio accounting and performance measurement service, combines a user-friendly microcomputer interface with the processing power, unlimited storage capacity, and facilities management capabilities of IDC's mainframe. *PASSPORT* also automatically updates cash positions, calculates and posts income, matures bonds, expires options, and performs paydown processing.

IDC has also added a product in the investment research category. *World-View* builds a PC-resident database from within Lotus 1-2-3, updates it automatically overnight, and makes the data available to analytical and graphics PC programs.

In Data Management Software, IDC has added *MarketPlus*, a comprehensive service through which IDC manages historical securities databases on its customers' computer systems.

Vendor

Interactive Data Corp.
95 Hayden Avenue
Lexington, MA 02173
(617) 860-8300

For information on its Canadian subsidiary, contact the U.S. headquarters.

Analysis

Interactive Data Corporation (IDC) provides financial and investment management systems supported by a comprehensive collection of financial databases. IDC's clients, including both individual and institutional investors, use its financial information for sophisticated planning and analysis systems. IDC clients can also access a proprietary database system and the advanced XSIM data analysis and modeling software system, in addition to standard applications.

Company Background

Founded in 1968 as a traditional timesharing company, IDC was acquired by The Chase Manhattan Bank, N.A., in 1974. IDC served as Chase's information services subsidiary until March 1988, when Dun & Bradstreet purchased it from Chase for $140 million.

IDC's financial database services and related on-line and micro-based analysis tools are designed for investment research, portfolio management, and trust and mutual fund accounting. Its software tools and applications are used to screen, analyze, display, and distribute the data from IDC's mainframe to dumb terminals, personal computers, or in-house computers. The company claims that the aggregate database it compiles, integrates, and distributes represents one of the largest, most comprehensive sources of financial data.

IDC has successfully implemented a strategy incorporating into its products the latest in microcomputer-to-mainframe technology. It now provides a vast array of financial databases and analytical software for investment research and management.

Services

IDC serves the financial services industry. In particular, the company targets specific job functions in certain market tiers. These include investment research, portfolio management, and pricing operations. Within these categories, IDC addresses quantitative analysis, fundamental analysis, and portfolio accounting applications.

Investment research involves in-depth analysis of securities (equity and fixed income) and the companies that issue them. IDC provides the data and analytical tools essential to this research process.

Portfolio services address the needs of portfolio managers with computer-assisted transaction accounting, portfolio appraisal, performance measurement, and quantitative analysis.

Pricing operations give trust departments access to pricing and descriptive data for corporate, municipal, government, and foreign securities, as well as pricing data for the valuation of mutual funds.

IDC has offices throughout the United States and in Toronto, Canada. A $65 million company, it employs more than 500 people.

Competitive Position

While IDC has no direct competition, it does compete with companies serving some of the same market niches. In terms of traditional timesharing services, IDC competes with Automatic Data Processing (ADP) and I.P. Sharp. For its portfolio management services, Data Exchange is a key competitor. In equity research, it competes with FactSet; in the area of data management systems, IDC competes with IDD's Tradeline.

Dun & Bradstreet is one of the world's top business information companies and can well support IDC with its considerable resources. The purchase of IDC strengthened D&B's holdings in the area of selected financial information services. When D&B purchased IDC, it owned another company whose product line nicely complements IDC's: Moody's FIS, a leading publisher of business information. D&B also owns Nielsen Marketing Research, Nielsen Media Research, and the Donnelley Directory.

Resources and Facilities

Processing Centers

IDC maintains two computer facilities: one in Waltham, MA and another in New York, NY. The

Delran NJ 08075 USA

Waltham facility houses an IBM 3084-QX mainframe computer and two Amdahl 470/V8 mainframes. The New York City installation contains an IBM 4361-5 mainframe computer.

IDC also has a variety of minicomputers, communications controllers, and RJE stations distributed around the country.

Systems Software

Operating Systems: IDC is migrating from its own proprietary operating system to IBM's VM virtual machine operating system to allow better compatibility with other software products. The operating system is tuned to support many on-line processing tasks with heavy database access.

Languages: Most programming for IDC's system is done in one of the company's advanced specialized application development languages, such as XDMS. The system also supports the following standard languages:

- Fortran
- Cobol
- PL/1
- VSBasic
- Assembler

Sales and Marketing Services

IDC maintains marketing offices in major financial centers. In the U.S., the company maintains offices in:

- Boston
- Chicago
- Hartford
- Los Angeles
- New York
- Philadelphia
- San Francisco

Outside the U.S., IDC has an office in Toronto, Canada.

Customer Support Services

IDC's marketing representatives deliver services to securities industry clients. They maintain contact with clients to keep current with their job functions and needs and to ensure that those needs are matched to the available resources.

In addition to marketing representatives' and clients' relationship, a consultant works with the marketing representative in a customer support role. A consultant is permanently assigned to a client, to help him or her get the most out of IDC's products and to provide customized programming services where necessary. A Data Support team at corporate headquarters responds to clients' data questions to ensure the data's accuracy.

In addition, a computer center HELP team assists with systems-related inquiries.

Application-Specific Services

Portfolio Services

IDC offers an integrated portfolio management software environment in which to analyze and measure the impact of investment strategies. Its products calculate rate of return and track investment selections, update holdings, and value portfolios.

PASSPORT—a micro-to-mainframe portfolio accounting and performance measurement service combining a microcomputer interface with the processing power, unlimited storage capacity, and facilities management capabilities of IDC's mainframe. *PASSPORT* tracks portfolio holdings of all asset types. Coverage includes equities, futures, options, and a wide variety of fixed income securities including corporates, municipals, mortgage-backed securities, zero coupons, money market preferreds, repos, and GICS. Operating on a trade and settle basis, *PASSPORT* automatically updates cash positions, calculates and posts income, matures bonds, expires options, and performs paydown processing. *PASSPORT* also evaluates options, performs paydown processing, and evaluates portfolio performance and reports through a resident report writer.

InterPort—a PC-based, international portfolio management system featuring multicurrency, multiuser, and multi-instrument capabilities. *InterPort* produces transaction statements, portfolio valuations, and cash flow projections, using Interactive's mainframe databases of pricing information. A performance measurement module calculates rates of return on a portfolio with a variety of breakdowns.

XPORT—a mainframe-based portfolio management and performance measurement system used to manage investment flow activity into and out of portfolio and to display the results of that activity in a report. Capabilities include maintaining portfolio data on a current and historical basis, accessing financial databases for pricing and capitalization changes, measuring performance over time, and performing comparative analysis against standard indexes or model portfolios.

Investment Research

IDC's products for investment research are divided into two business areas, Equity Research and Fixed Income.

Equity Research

WorldView—builds a PC-resident database from within Lotus 1-2-3, updates it automatically overnight, and makes the data available to analytical and graphic PC programs.

ANALYSTX Financial Applications—a variety of easy-to-use application programs for analyzing and manipulating ANALYSTX data. The ANALYSTX series includes a wide selection of reports and graphs based on these data.

PC ANALYSTX—micro-mainframe-linked applications to analyze and manipulate IDC's ANALYSTX data. It contains a variety of financial reporting and graphics applications.

DataSheet—a micro-to-mainframe-linked spreadsheet product providing instant access to IDC's extensive databases of current and historical pricing, rates, and fundamental data for U.S. and international equities, bonds, commodities, foreign exchange, and money markets updated daily. Data can be saved for use with Lotus 1-2-3 or Symphony.

PC SCREEN—a micro-to-mainframe product offering instant screening of 6,500 companies to identify those meeting user-defined criteria. Over 350 fundamental, technical, business segment, earnings estimates, and precalculated ratios data are available. Users can also calculate their own items. Reports can be printed or downloaded to the microcomputer.

Report Library—a micro-to-mainframe application providing central storage, remote retrieval, and transferring of research reports.

XSCAN—mainframe, command-driven screening system that scans any database for securities, companies, etc., meeting the user's criteria.

IDSI Data Services

IDC offers securities pricing services, notification services, fund evaluation services, and estate evaluation services.

Mutual Fund Evaluation Services

IDC delivers a range of securities prices for the mutual fund industry. The company prices corporate, government, agency, and municipal bonds and equities—including over-the-counter securities and options. Same-day quotes for foreign securities are also available. Prices can be delivered on-line or sent directly to a customer's mainframe or microcomputer. Software can be tailored to the customer's own format for in-house processing.

IDCPRICE/CompuTrac

IDCPRICE is a communications link to IDC's stock market data available to CompuTrac (a technical analysis software vendor) users. IDCPRICE is available to IBM and Apple users. Current and historical data are available on stocks, indexes, indicators, mutual funds, options, and commodities (IBM users only).

Data Management Software

IDC offers the ability to manipulate and analyze data through proprietary analytical software, which it claims is easy to use and tailored to provide specific analyses required by individual users.

IDC's systems offer all functions required to access and maintain its own databases or client databases.

MarketPlus—is a comprehensive service through which Interactive Data manages historical securities databases on its customers' computer systems. *MarketPlus* can be installed on an IBM mainframe, IBM minicomputer (9370), or a Digital VAX system. *MarketPlus* consists of historical databases, software for screening and analyzing the data, and an electronic service through which the historical data are updated automatically.

Data Distribution System—a micro-mainframe data network product allowing database owners to distribute their data using IDC's network and its DataWindow, a micro-resident analytical software package.

DATAFEED—IDC's communications interface that links its databases to investment, portfolio management, or technical analysis software. Authorized software vendors, selected by IDC, link their microcomputer software developed for an individual investor to IDC's databases.

DataWindow—a micro-based system that screens financial databases distributed via IDC's computer network. It combines and screens multiple databases with user-defined screening criteria and basic arithmetic functions. Users can download data to their PCs, screen large databases, and generate sophisticated reports.

Third-Party Products

Products developed and owned by many well-known, third-party vendors are also available through IDC. These include:

BARRA (Barr Rosenberg Associates)—mainframe-based risk models for equities, bonds, and international securities.

BONDSPEC (Specialist Software Ltd., of London)—integrated programs that access information for international and U.S. bond markets.

Capital Management Sciences (Capital Management Sciences, Inc., of California)—a set of fixed income analysis applications.

Networking Services

IDC's network and data communications are provided through Dun & Bradstreet's DunsNet. DunsNet supports local dial-up service in over 175 cities in the continental United States and Hawaii. Internationally, DunsNet accesses 80 cities in Europe, 12 cities in the Far East and Australia, and 10 cities in Canada. Indirectly, customers can access D&B host databases from an additional 70 countries via network gateways to international record carriers.

On-Line Databases

IDC contends that it offers one of the largest, most comprehensive collections of financial databases commercially available. Its databases contain current and historical data on more than 10,000 foreign and domestic companies, 250 utilities and 100 telephone companies, more than 60,000 North American securities, and over 26,000 securities traded outside North America. Daily prices are available for over 1.7 million municipal bonds. Commodities, financial futures, and foreign exchange data are also available.

Security Master	contains descriptive information for all equities, options, indexes, and fixed income instruments represented in the *PRICES*, *MASTERPRICE*, *Split & Dividend*, *Monthly*, *Quarterly*, *COMPUSTAT*, *Value Line*, *Call/Sinking Fund*, and *I/B/E/S* databases. Data provided are Interactive Data symbols, CUSIP numbers, exchange tickers, security descriptions of various lengths, quality ratings, start and end dates of the price series, and codes indicating status and other characteristics. Data is collected by Interactive Data Services, Inc. from several sources.
PRICES	daily price, volume, earnings, and indicated dividend information. The database covers equities, fixed income instruments, options, and other securities traded on major and regional U.S. exchanges, major Canadian exchanges, and in government issues markets. FASTPRICE/FASTBOND service offers daily closing prices as well as bid and ask quotes for NASDAQ-listed securities from about 4:30 p.m. to 6:00 p.m. EST.
MASTERPRICE	contains weekly bid prices, yields, and indicated dividend information for unlisted securities not covered in the *PRICES* database.
Split & Dividend	contains stock split and stock and cash dividend information for all dividend-paying securities, including common stocks, preferred stocks, and foreign issues.
Monthly/Quarterly	contains quarterly earnings per share data, monthly shares outstanding, and monthly holding period returns for issues traded on the New York and American Stock Exchanges and NASDAQ; it also provides monthly short interest and insider transactions for New York and American Stock Exchange issues.
Call/Sinking Fund	contains call features and sinking fund provisions for approximately 8,000 active corporate and U.S. government issues. Also provides conversion terms for 1,500 convertible bonds and convertible preferreds.

Mortgage-Backed Securities	contains descriptive and factor information for individual GNMA pass-through pools.
Municipal Bond	contains descriptive information for municipal issues and daily evaluation prices for municipal issues. Certain additional items, such as coupon rate, maturity date, and issue date, are provided for individual issues.
Money Markets	contains domestic and international market rates for various types of direct government obligations, quasi-government obligations, bank rates, money market instruments, and money market funds.
Commodities	contains daily cash and contract settlement prices, volume, open interest, and descriptive information for more than 75 agricultural commodities, metals, their futures contracts, and financial and currency futures traded on the major U.S., Canadian, and London commodity exchanges.
Foreign Exchange	contains bid and asked exchange rates for the spot market and for 1-month, 2-month, 3-month, 6-month, and 12-month forward rate contracts for major currencies. All exchange rates are expressed in U.S. dollars per foreign currency unit.
International Securities	lists descriptive data for securities, currencies, and indexes; capital change and dividend information; and daily prices for securities quoted in the United Kingdom, Europe, Australia, Asia, South America, and Africa.
International Bonds	contains daily prices and descriptive information for approximately 4,500 bonds traded in Germany.
EXSTAT	presents descriptive and accounting data for more than 2,000 companies in the United Kingdom, continental Europe, Australia, and Japan. EXSTAT provides figures from the companies' balance sheets and profit and loss accounts, plus security data relevant to the accounts.
COMPUSTAT Databases	accesses the COMPUSTAT Industrial, Utility, Business Information, and Telecommunications databases, which contain balance sheet, income statement, and application of funds data for a large number of companies.
ZACKS Earnings Estimates	lists earnings per share estimates for approximately 2,700 companies included in the Compustat databases.
Value Line Industrial	contains annual, quarterly, and some monthly historical financial statistics and ratios for more than 1,600 major industrial, transport, retail, utility, and railroad companies; over 75 Value Line Composites; and a Value Line company composite.
Value Line Business Line	contains line of business data for more than 1,600 major industrial, retail, transportation, and utility companies. Also provides annual data on sales, names, industry codes, and general information for up to 10 major divisions within a corporation.
Value Line Financial	presents historical financial statistics and ratios for approximately 100 major banks, savings and loan associations, and insurance companies. Provides annual data from income statements, balance sheets, and statements of changes.
Value Line Small Company	accesses annual and quarterly historical and financial statistics and ratios for over 800 smaller capitalization industrial companies.
I/B/E/S	provides access to 52 earnings per share and related figures for over 3,000 companies for the current and next fiscal years and fiscal quarters. Over 100 major institutional and regional brokerage firms contribute their analysts' estimates to this "market expectational" database.

Future Plans

IDC's strategic plan still remains the same and calls for the development and marketing of:

- Even higher quality securities data.
- Database management software to enable customers to store and access their own and the company's data on in-house computers.
- A securities research environment, including applications for analysis of equity, fixed income, and other securities.
- A portfolio management environment, including applications for portfolio analysis, reporting, and performance measurement. ■

Interactive Market Systems (IMS)

COMPANY INFORMATION

Interactive Market Systems, Inc.
55 Fifth Avenue
New York, New York 10003 (212) 924-0200, (800) 223-7942

UPDATE: *Interactive Market Systems (IMS) added several databases to its United States Print category of files. Since our last report, IMS also enhanced some of its other files and added to its client base.*

Company Background

Founded in 1969, Interactive Market Systems, Inc. (IMS) is a member of the VNU Marketing Information Services Group. Employing more than 100 people, IMS provides programs to access and analyze more than 400 syndicated and proprietary databases containing product and audience data. Its databases cover both domestic and international audiences and are primarily used for media and marketing planning.

Analytic programs available to clients include cost ranking and cost efficiency calculations, advertising-campaign modeling and flowcharting, graphics packages, cross tabulations, reach and frequency analysis, optimization, and competitive analysis.

IMS employees service both on-line and microcomputer products. Methods of accessing these products include realtime on-line timesharing, batch processing, downloading from mainframe to microcomputer, local storage on microcomputer, and service bureau.

Competitive Position

As a company specializing in providing on-line and microcomputer services to advertising and marketing management, IMS has only one full-service competitor—Telmar. IMS, however, also competes with companies specializing in specific mediums, such as radio. These companies include Marketron and Market-by-Market. Also, some companies compete with IMS on the software level, but, unlike IMS, their main business is market research.

Financial information for Telmar is unavailable since it is privately held. IMS research indicates, however, that IMS has the greatest market share. This holds no matter what criterion is used—number of clients, annual revenues, etc.

IMS now has about 1,200 clients, and it continues to add new databases as well as enhance existing ones.

A member of the VNU Marketing Information Services Group, Interactive Market Systems, Inc. (IMS) was established in 1969. It now ranks as a leading provider of on-line databases, many of which feature product and audience data compiled by such leading market research firms as Arbitron, A.C. Nielsen, Simmons Market Research Bureau, and Mediamark Research, Inc. Select national and international databases can also be accessed on such local storage devices as CD-ROM disks and the Bernoulli Box, using IMS micro programs.

IMS also provides microcomputer programs that aid in accessing and analyzing its databases. IMS' more than 400 databases are primarily used for media and marketing planning.

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RESOURCES AND FACILITIES

Processing Centers

IMS' processing center features two Digital Equipment Corp. 2065 systems which provide on-line services and a Digital Equipment Corp. MicroVAX.

Customer Support Services

IMS provides its clients with English-language codes for available databases, as well as documentation and training on use of its on-line microcomputer software.

Sales and Marketing Services

IMS sales are handled through the following locations:

- Beverly Hills, California
- Chicago, Illinois
- Honolulu, Hawaii
- London, England
- New York City, New York
- Oslo, Norway
- Paris, France
- Toronto, Canada
- Brussels, Belgium

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Interactive Market Systems (IMS)

Pricing

IMS reports that pricing is usually based on a leasing arrangement tailored to the particular client. Terms take into account the time spent on-line, the length of the contract, and whether IMS software is used.

NETWORKING SERVICES

Access to IMS services is via direct dialing in New York City, with local access via CompuServe in other major cities.

ON-LINE DATABASES

IMS provides on-line access to over 400 public and proprietary databases, oriented toward advertising and marketing management. The IMS microcomputer system allows downloading of databases from the mainframe for manipulation on a microcomputer, as well as local storage for selected national and international databases.

The following databases are available through the telecommunications networks used by IMS:

United States Broadcast

Arbitron Network and/or Syndicated Programs by ADI *(Area of Dominant Influence)*—average quarter-hour network and spot TV allocation analysis.

Arbitron Radio Metro/TSA Ratings Reports; ADI Ratings Reports—spot radio audience analysis for all ADIs and Metros.

Arbitron's Time Period Tape—a spot TV allocation analysis study that measures the average quarter hours for each time period. This measurement is averaged across weeks covered in a study.

Broadcast Advertisers Reports—Network TV—a study monitoring every broadcast commercial minute for national television networks, providing information on broadcast activity and expenditures.

Comprehensive Agimedia Measurement Study—farm radio and TV rating data for Class I and Class II farmers by crop type or industry. Studies cover south, central, and western states.

Nielsen Network Programs by DMA—network TV allocation analysis, containing TV audience data by program/daypart by DMA for any measured demographic area.

United States Print

ACORN—demographic profiles of residents in 44 unique neighborhoods identified through cluster analysis linked to syndicated services.

American Sports Data Study—annual study of sports participation, the U.S. sporting goods market, and the media behavior of the general U.S. population.

Birch/Scarborough—local market studies of audience data for magazines, newspapers, radio, and TV stations with key demographic and product data.

Business-to-Business—a study of business-purchase decision makers from respondents in the Mediamark Research, Inc. (MRI) sample.

CIRCS—circulation data and rate bases for a number of U.S. magazines. The Audit Bureau of Circulation is the source of the data.

Clusterplus—geodemographic target marketing segmentation system linked to syndicated services.

Consumer Innovators—a study that singles out people who are regularly the first to try out new products, taken from respondents in the Mediamark Research sample.

Farm Audience Readership Measurement Service (FARMS)—a study conducted among a representative sample of all commercial operators in the U.S. through mail interviewing. It provides a measure of the average issue audience for each of the approximately 75 publications, including national, regional, and state publications.

JD Power and Associates New Truck and New Car Buyer Studies—a research report examining the new truck and new car markets and the media habits of purchasers. Data measured includes purchase preferences, positioning, usage considerations, demographics, and media habits of buyers.

Leisure Style—segmentation of Mediamark Research respondents according to their leisure time activities.

Mediamark Research, Inc. (MRI)—multimedia and marketing data for magazines, television, cable, and radio collected by questionnaires and by personal interviews.

Mendelsohn Media Research—a study, conducted by mail, of market and media habits of U.S. adults with a household income of $50,000+.

Pace—a service containing county-by-county circulation data for 600 weekly, 1,300 daily, and more than 200 other publications, the data is updated on an ongoing basis.

Interactive Market Systems (IMS)

Prizm—national life-style segmentation system that can predict consumer behavior by zip code clusters. Each cluster has its own unique demographic definition linked to syndicated services.

Purchase Influence—American Business Executive—conducted by Marketing Projects Group, Inc., this study surveys the influence of top management in the purchase of more than 30 business products and services. Also surveyed: magazine readership and network and cable television.

Roper Reports—a public opinion study measuring attitudes of adults ages 18 and over on social, political, economic, and business issues.

Scarborough National Newspaper Study—A U.S. study (SMSA/ADI) of newspaper readership with key demographics for media and marketing planning.

Simmons National College Study—a study of full-time college students covering such areas as the products they use, the media that reach them, and their personal activities and life-styles.

Simmons Study of Media & Markets—a national study of audiences for magazines, television, radio, newspapers and Sunday supplements, outdoor advertising, and yellow pages magazine readership, providing psychographic and demographic characteristics, plus information on media habits and product consumption.

Simmons Teenage Research Study (STARS)—U.S. national teen study (ages 12 to 19) of magazines with key demographic and product data. The magazines measured are popular with teenagers.

Simmons Top Management Insights Study—media and marketing information for top management. The database includes purchase and travel information.

SMRB's National Study of Local Newspapers—a U.S. SMSA/ADI study of newspaper readership with key demographics for media and market planning.

Teenage Research Unlimited (TRU)—magazine and product usage data for teenagers ages 12 through 19.

Upper Deck—a study of affluent adults from respondents in the Mediamark Research sample, divided into five life-style segments.

Values and Lifestyles (VALS)—a study of changing life-styles and values of Americans that is classified by population into eight different consumer types, and these are distinctly characterized by behavior and emotion linked to syndicated services.

Vision—geodemographic target marketing and life-style segmentation system linked to syndicated services.

International

Arbeitsgemeinschaft Media-Analyse (AGMA)—interviews that were conducted in Germany, containing media and demographic data for use in media and marketing planning.

Asian Profiles—media and purchase data collected from a study of Asian adults, ages 25 and over, in influential occupations in Hong Kong, Kuala Lampur, Singapore, Bangkok, Jakarta, Manila, and Taipei.

Australia-Wide Survey of Readership of Magazines—a continuous survey of readership in Australia.

British Market Research Bureau—the study contains media information based on recency and frequency of reading, television and radio exposure, demographics, and product usage. Adults in the United Kingdom are the source of the information, which covers all major products and brands.

British National Readership Survey (NRS)—a survey of the reading patterns of United Kingdom adults. NRS surveys newspapers and weekly, monthly, and bimonthly magazines against demographics and special-interest questions.

Broadcasters Audience Research Board (BARB)—a survey of television viewing in the United Kingdom broken down by demographics. The database covers approximately 8,000 weekly respondents.

Etude IPOS II Cadres—Informatique—media and demographic data on men and women in middle and upper management positions in France.

European Businessmen Readership Study (ERBS)—a study of European senior male executives, concerning media exposure, demographics, and special-interest questions. The countries surveyed are Austria, Belgium, Denmark, France, Finland, Germany, Italy, Luxembourg, The Netherlands, Norway, Spain, Switzerland, and the United Kingdom.

French National Readership Survey (CESP)—a survey of adults in France, containing media, product, and demographic data.

German Business Readership Survey (LAE)—German male executives defined as decision makers in business and administration. Media readership plus selected business-related data are included.

International Finance Managers Study (IFM)—a study containing demographic and media information on all senior male European financial managers in Austria, Belgium, Denmark, Finland, France, Germany, Italy, The Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

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Interactive Market Systems (IMS)

International Herald Tribune Readership Study (IHT)—a study of *International Herald Tribune* readers; demographic information and purchasing decisions are covered.

Irish National Media Survey (INM)—a survey of the adult population of the Republic of Ireland, containing data on media exposure and demographics.

Mealink (MEAL)—advertising expenditures in the national press, television, and magazines in the United Kingdom. Advertised brands are organized by product group and category.

Media Index Survey—Hong Kong—a survey of adults in Hong Kong, containing media, demographic, and product data.

Media Index Survey—Indonesia—a survey of Indonesian adults, ages 15 and above, containing media, demographic, and product data.

Media Index Survey—Malaysia—a survey of Malaysian adults, ages 15 and over, containing media, demographic, and product data.

Media Index Survey—Singapore—media, demographic, and product data on adults in Singapore ages 15 and over.

Media Index Survey—Thailand—media, demographic, and product data on the adults of Thailand ages 12 and above.

MMEMS—media exposure of decision makers in the Middle East.

National Businessmen Readership Study (NBRC)—surveys business executives in the United Kingdom. Information on media exposure, demographics, and special-interest questions are included.

National Farm Readership Study (NFR)—a study of farmers in the United Kingdom with 20 or more acres of land. It includes both livestock and agriculture farmers and contains media and demographic information.

National Medical Readership Survey—media exposure information pertaining to doctors in the United Kingdom.

National Onderzoek Permedia (NOP)—demographic and media information for The Netherlands based on 9,930 interviews.

National Audience Data Bank (NADBANK)—Canadian national study of daily newspaper readership, providing demographic information for weekday and weekend newspapers in major Canadian markets.

Norsk Nedieindeks (NOR)—a study of all adults in Norway. NOR contains media, demographic, and special-interest information and detailed questions on products, services, purchase influence, attitudes, life-styles, etc.

North Ireland Readership—attitudes toward media and shopping behavior.

Pan European Survey (PES)—a marketing and readership study of executives and professionals in Europe. Demographic, travel, product, and media data are included.

Print Measurement Bureau—a Canadian national study of consumer magazine readership with standard demographic breaks of age, sex, education, occupation, family income, and product data.

MICROCOMPUTER/SOFTWARE SERVICES

The IMS family of microcomputer applications currently includes the following media planning tools:

- RandF
- CRank
- MixMastR
- MeteRfax
- TVplanR
- FloChart
- Prelude:XTAB
- Prelude:PC Bank
- Tab-It
- Optimizer
- NPACS
- NCS
- RateEdit

FUTURE PLANS

IMS will continue to enhance its products and services through horizontal and vertical market extensions both in North America and abroad. ☐

I.P. Sharp Associates Limited

COMPANY INFORMATION

I.P. Sharp Associates Ltd., A Reuter Co.
2 First Canadian Place
Suite 1900
Toronto, Ontario M5X 1E3 (416) 364-5361

UPDATE: *I.P. Sharp has developed several new databases for the markets it serves. Four new databases were added for the economic market, and two were added for the financial market. Even though its operational record was again excellent for the past year, I.P. Sharp's processing center has switched from using two IBM 3084 mainframe computers containing 96M bytes of memory total, to two larger mainframe computers with a total 128M bytes of memory and 96 channels.*

Company Background

A subsidiary of Reuters Holdings plc of London since June 1987, I.P. Sharp Associates Limited was formed in 1964 by Ian Sharp and seven colleagues. Originally a software company, I.P. Sharp has expanded to become an international supplier of historical information, software, and financial products.

Reuters is a leading world news and information organization. The company has provided the media and business community with vital information for over 140 years. The Reuter Historical Information services comprise the numeric data of I.P. Sharp, the textual databases of Reuter subsidiary Finsbury Data Services Limited of London, and Reuter reports.

I.P. Sharp is one of the world's leading timeshare network and numeric database companies, with data covering the areas of finance, economics, energy, and aviation. In 1976, the company installed its own private packet-switched network, IPSANET. Today it links major financial and economic centers worldwide and delivers services from I.P. Sharp, Reuters, and Finsbury. The network is now being integrated into the Reuter communications system.

I.P. Sharp has also developed several financial software products, including the Global Limits Control System, for foreign exchange and money market trading, and the BLEND system for controlling and managing the borrowing and lending of securities.

I.P. Sharp has built its expertise around SHARP APL, a powerful, concise, and highly productive programming language. I.P. Sharp employs some 420 people worldwide with 20 offices in North America, Europe, Australia, and the Far East. The company is also represented by agents in 10 locations.

Headquartered in Toronto, I.P. Sharp Associates Limited was founded in 1964 and became a Reuter company in 1987. The systems, databases, and network of I.P. Sharp augment the Reuter Historical Information services along with the textual databases of Finsbury Data Services Limited of London.

I.P. Sharp is one of the world's leading database companies, specializing in finance, economics, energy, and aviation. Its numerical databases are targeted to the financial and business world.

Services from Reuters, I.P. Sharp, and Finsbury are delivered through the I.P. Sharp international packet-switched network, IPSANET, which links major financial and economic centers worldwide.

I.P. Sharp's databases, as part of Reuter Historical Information services, are marketed through Reuter sales offices.

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Competitive Position

I.P. Sharp and its customers are now starting to realize some benefits as a result of Reuters' buyout of I.P. Sharp in 1987. The electronic data services of Reuters, its other subsidiaries, and I.P. Sharp are becoming more integrated. For example, Sharp customers can now access data from I.P. Sharp, Finsbury Data Services Limited, and the Reuter Historical Information Services through a menu-driven front-end called Reuter file.

Another effect of the Reuters' buyout is that I.P. Sharp is no longer marketing its IPSANET Network in the same way. While it's still sold as a value added network, that's not its major purpose any more. For the most part it has been incorporated with the Reuters network, serving mostly as a resource for Reuters and its subsidiaries.

I.P. Sharp, while a leading supplier of financial, aviation and energy databases, is now concentrating on its financial files. This reflects its association with Reuters, a company that already has a strong presence among users of financial information. By concentrating on financial information, I.P. Sharp is building on Reuters' strengths. Other vendors of financial data include Data Resources (DRI), International Data Corporation (IDC), and DIALOG Information Services. Internationally, I.P. Sharp competes with Datastream, Telekurs, and IDC.

▷

I.P. Sharp Associates Limited

RESOURCES AND FACILITIES

Processing Center

The I.P. Sharp data center, located in Toronto, contains an IBM 3090-300E mainframe computer and a NAS EX80 mainframe computer, each with 128M bytes of memory and 96 channels.

Reliability

According to the vendor, the Sharp APL timesharing service was operational 99.9 percent of its scheduled hours of service during the five years ended December 31, 1988.

Customer Support Services

I.P. Sharp Associates provides technical support and customer education through over 30 offices and representative agencies worldwide. In addition, an electronic mail facility lets users directly communicate with the people ultimately responsible for maintaining the system(s) they are using.

Networking Services

I.P. Sharp claims it is the only company that integrates a full range of software products with on-line databases and a private telecommunications network (IPSANET). I.P. Sharp views IPSANET as the backbone of the company. Launched in 1976, IPSANET is now interfaced to more than 20 public networks including Tymnet, Telenet, Telex, and Datapac. This private packet switched network provides over 600 cities worldwide with local telephone access to Sharp's timesharing service. While formidable, IPSANET faces strong competition from GE Information Service's (GEIS') network, which is also quite extensive.

APPLICATION-SPECIFIC SERVICES

Mailbox/PC

Mailbox/PC provides users of an IBM PC/XT/AT, PS/2, or compatible with an easy-to-use interface to I.P. Sharp Associates' electronic mail system—Mailbox. The system operates in full-screen mode with on-diskette Help always available.

Users can display messages on the PC's screen, direct them to a printer or save them in a file. Messages can be composed on-line, but it is also possible to transmit previously stored messages created using a word processing package.

Compu Trac Data Collection

I.P. Sharp's Compu Trac Data Collection software lets users of its Compu Trac technical analysis package download data from I.P. Sharp pricing databases to their own computers. Users must own the Compu Trac software, a package sold by the Technical Analysis Group of New Orleans, Louisiana.

I.P. Sharp's Compu Trac data collection package sells for $200 (U.S.). Rates for using the data collection software are $6 per hour for 30 cps terminals or $12 per hour for 120 cps terminals, plus a charge of $0.012 per data item unit.

Pricelink Data Collection

A tool for spreadsheet analysis, Pricelink lets investors and traders collect I.P. Sharp daily financial pricing data and store it on a computer file for further analysis using Lotus 1-2-3, Symphony, or other spreadsheet software. Pricelink rates are the same as those for Compu Trac (given earlier).

Data Analysis and Reporting System

MAGIC allows the user to retrieve, manipulate, and plot data, whether it is stored in a private database or in one of over 100 I.P. Sharp databases. Magic is fully integrated with SUPERPLOT, I.P. Sharp's business graphics package, and EASY, an econometric analysis package.

ON-LINE DATABASES

I.P. Sharp Associates is one of the world's largest suppliers of on-line numeric databases. Detailed information on most of the I.P. Sharp databases can be found in the On-line Databases section (OL40) of this publication. Currently, more than 60 million time series of data provide users with up-to-date, on-line databases in the following areas: aviation, economics, energy, and finance.

Data can be accessed, analyzed, and manipulated using two data retrieval systems: INFOMAGIC and MAGIC

For a casual database user, INFOMAGIC provides a menu-driven system to access standard preformatted reports, while allowing the user to control time frame and search criteria.

For data manipulation and customized reports, the user can also retrieve, analyze, and display data using MAGIC which provides straightforward, English-language commands that take the user through input, analysis, and output. The user can also use MAGIC to combine retrieved data from one or more I.P. Sharp databases or combine it with proprietary data. Other software packages can be used in concert with MAGIC to perform sophisticated econometric analysis and reporting.

I.P. Sharp Associates Limited

I.P. Sharp data can be retrieved for local analysis by the user's own programs or by software such as Lotus 1-2-3 or Compu Trac.

Each I.P. Sharp database has documentation, either on-line or in a user's manual, along with directories of the databases' contents.

Pricing

Most databases are offered without surcharge or subscription fee other than the normal charges for computer usage.

Aviation

Airport Operators Council International (AOCI)—detailed airport and aviation information by airport from the *Worldwide Airport Traffic Report.*

Association of European Airlines Financial and Traffic Statistics (AEA)—traffic and financial statistics describing the operations of European airlines.

Canadian Operating Statistics (COPS)—operating statistics and statements of income for each of the seven major Canadian airlines.

Combined T9/Service Segment Traffic Statistics (T9S)—monthly domestic nonstop airport-pair data at the carrier and aircraft-type level (not including flight number).

Commuter Flight Statistics and Online Origin and Destination Data (Commuter)—origin-destination and flight statistics for commuter airlines. Commuter airlines are those that have regularly scheduled passenger service on aircraft seating fewer than 60 passengers or cargo service carrying less than 18,000 pounds.

ER586 Service Segment Traffic Statistics (ER586)—detailed monthly summaries of all traffic on each flight segment flown by certified, United States-route air carriers.

FORM 41 Financial and Traffic Statistics for U.S.-Certified Airlines (FORM41)—Form 41 traffic and financial schedules submitted to the United States Department of Transportation (DOT) by all U.S.-certified air carriers.

IATA Statistical Information System (IATA)—international data on airline traffic and capacity, including Atlantic Traffic and Capacity Statistics (TCS) and Monthly International Statistics (MIS).

Official Airline Guide (OAG)—flight schedules of about 700 international and North American airlines.

Official Airline Guide Electronic Edition (OAGEE)—permits users to examine various alternatives for air travel schedules, fares, seat availability, and hotel information; in North America, allows users to make airline reservations as well as order and pay for tickets.

Origin and Destination Travel Statistics Tables 8, 10, and 12 (OAND)—results of a continuous survey of the domestic itineraries of 10 percent of all passengers traveling on U.S.-certified carriers.

Ticket Dollar Value Origin and Destination Data (OD1A)—true origin and destination fare data obtained from a continuous survey of the itineraries of 10 percent of all passengers flying on U.S.-certified carriers.

United States International Air Travel Statistics (INS)—number of passengers flying each month between the United States and foreign ports, not including Canada.

Economics

Australian Bureau of Agricultural and Resource Economics (ABARE)—indexes of prices paid and received by Australian farmers, including a breakdown by state within Australia. All data is in the form of indexes; over 800 different time series make up this database.

Australian Bureau of Statistics Time Series Data (ABS)—major socioeconomic and financial statistics relating to Australia.

Australian Customs Clearance Statistics (ACCCN)—quality, value, and duty paid for commodities cleared from Australian Customs for home consumption.

Australian Export Statistics (AECC)—values and quantities of commodities exported to Australia's trading partners.

Australian Export Statistics (Harmonized) (AEXPORTS)—value and quantity of commodities exported, by state, to Australia's trading partners.

Australian Import Statistics (AICC)—values and quantities of commodities imported from Australia's trading partners.

Australian Import Statistics (Harmonized) (AIMPORTS)—value, duty paid and quantity for commodities imported into Australian and cleared from customs for home consumption.

Austrian Economic Outlook (OEKON)—a survey for total industry covering five facts: level of orders, foreign orders, level of production, sales prices, and level of employment, with four ratings for each fact.

Citicorp CITIBASE United States Economic Data (CITIBASE)—U.S. economic statistics, including finance business information, construction, manufacturing and trade, prices, industrial production, capacity utilization, la-

DATAPRO RESEARCH, DELRAN NJ 08075 USA

bor, national income and product accounts, forecasts, business conditions, energy, and international statistics.

Country Economic Profiles (CEP)—economic profiles of 193 countries.

Deutsche Bundesbank Data (BUNDESBANK)—financial and economic data issued monthly by the West German Bundesbank.

Eastern Bloc Countries Economic Statistics (WIIW)—major economic statistics for the Eastern Bloc countries. Available statistics include production, government incomes and outlays, consumption, employment and population, investment, capital stocks, imports/exports, national income, productivity, retail trade turnover, state purchases, wages and salaries, crop yields, and miscellaneous data.

Economist Intelligence Unit International Statistics (EIU)—internationally comparable macroeconomic data on 66 major developing countries as well as seven Eastern Bloc countries.

Federal Republic of Germany Economic Outlook (IFO)—results from a regular survey of German businesses on the country's economic situation.

IMF Direction of Trade Statistics (DOT)—total U.S. dollar import and export statistics between approximately 225 reporter countries and 235 partner countries.

IMF International Financial Statistics (IFS)—economic information concerning more than 200 countries, including exchange rates, international liquidity, money and banking, international trade, prices, production, government finance, and interest rates.

Institute of International Finance Country Evaluation System (IIF)—detailed economic and financial information concentrating on lesser developed countries. Designed to assess a country's debt position.

National Planning Association United States Demographic Forecast Data (NPADEMOG)—historical and forecast demographic data for the U.S., analyzing the population by age, sex, and race.

National Planning Association United States Economic Forecast Data (NPAECO)—historical and forecast economic data on earnings, employment, and income for the U.S., broken down to county level.

Organisation for Economic Co-operation and Development, Annual Labour Force Statistics (OECDALF)—annual labor force statistics for the 24 OECD countries, covering population, labor force, civilian employment, and salaried employees by activity and by manufacturing industry.

Organisation for Economic Co-operation and Development, Annual National Accounts, Volume 1, Main Aggregates (OECDANA1)—annual national accounts main aggregate information for the 24 OECD countries plus Yugoslavia and three country groupings (E.E.C., OECD-Europe, and OECD-Total), based on the U.N. system of national accounts and transformed by the OECD for the purpose of providing internationally comparable data. Information includes government and private expenditures, imports and exports of goods and services, and gross fixed capital formation (all at both current and 1980 prices), plus national income, net savings, and net capital formation.

Organisation for Economic Co-operation and Development, Annual National Accounts, Volume 2, Detailed Tables (OECDANA2)—detailed national accounts information for the 24 OECD countries plus Yugoslavia, based on the U.N. system of national accounts. Data for each country is classified into 15 major groupings covering about 44 industries and includes main expenditures by type and purpose, gross capital formation by type of good and owner, and employment by kind of activity.

Organisation for Economic Co-operation and Development, DAC External Debt of Developing Countries (OECDEXD)—statistics on external indebtedness for 141 developing countries and territories that give an estimate of the conditions and commitments, the outstanding external debt and debt service position of each country by main creditor source, plus a selection of indicators of economic performance.

Organisation for Economic Co-operation and Development, DAC Financial Flows to Developing Countries (OECDDAC)—recent, annual, U.S. dollar historical information of financial flows to 216 developing countries and territories collected by the Development Assistance Committee from its member countries.

Organisation for Economic Co-operation and Development, Economic Outlook (OECDEOL)—macroeconomic statistics and forecasts for the 24 member countries of the OECD.

Organisation for Economic Co-operation and Development, Flows and Stocks of Fixed Capital (OECDCAP)—a standard breakdown of gross and net fixed capital stocks, gross fixed capital formation, and consumption of fixed capital, all at current and constant replacement costs. Data is further broken down by industry, product, volume, and local currency. Countries covered are Australia, Canada, Finland, France, Germany, Greece, Italy, Japan, Norway, Sweden, the United States, and the United Kingdom.

Organisation for Economic Co-operation and Development, Indicators of Industrial Activity (OECDIIA)—indicators of industrial activity that attempt to provide a basis for analysis of different industrial sectors in the 24 OECD countries and country groupings.

Organisation for Economic Co-operation and Development, Main Economic Indicators (OECDMEI)—reports on economic development in the 24 OECD member countries

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and Yugoslavia. Contains over 6,200 time series covering national income and product accounts; industrial production; stocks, deliveries, and orders; labor and wages; construction; internal and foreign trade; interest rates; producer and consumer prices; and balance of payments.

Organisation for Economic Co-operation and Development, Monthly Statistics of Foreign Trade (Series A) (OECDTRA)—international, U.S. dollar statistical data concerning the foreign trade of OECD member nations, including seasonally adjusted import and export figures; volume, price, and average value indexes and foreign trade of OECD member countries by partner countries.

Organisation for Economic Co-operation and Development, Quarterly Labour Force Statistics (OECDQLF)—major labor force components for most OECD countries that publish such data regularly.

Organisation for Economic Co-operation and Development, Quarterly National Accounts (OECDQNA)—about 2,500 time series covering national income and production; personal and government consumption expenditures; fixed capital formation; imports and exports of goods and services; changes in stocks; and price deflators.

Organisation for Economic Co-operation and Development, Revenue Statistics (OECDTAX)—detailed statistics on general government tax revenues for each OECD country except Iceland, allowing comparisons of tax structures among the countries, and providing details on revenue sources for supranational authorities and on revenues due to import, export, or consumption taxes on specific commodities. Information on financing of social security benefits and payroll taxes paid by governments is also available.

Reserve Bank of Australia Bulletin (RBA)—financial and economic information as published by the Reserve Bank of Australia in its monthly bulletin, including qualifying comments.

S.J. Rundt World Risk Analysis Package (SJRUNDT)—textual reports giving country risk assessment. The reports supply sociopolitical prognoses, domestic market forecasts, and external accounts projections.

Statistics Canada CANSIM Socio-Economic Data Base (CANSIM)—comprehensive statistics on Canada covering socioeconomic characteristics, internal activities and external trade including information on national accounts, industry, finance, labor, transport, agriculture, health and welfare, prices, and population.

United Nations Commodity Trade Statistics (SITC)—details (values and quantities) of international trade, as reported by 31 major industrial nations, of more than 3,000 commodities, according to the Standard International Trade Classification (SITC) Revision 2.

United States Consumer Price Index (USCPI)—indexes of the cost of consumer goods and categories of consumer goods.

United States Inter-Sector Flow of Funds (USFLOW)—over 3,600 time series on the sources and uses of funds in the United States economy for over 50 major sectors.

United States Producer Price Index (USPPI)—producer price indexes on a variety of goods and services for the United States. There are about 6,000 time series.

United States Producer Price Index Revision (USPPIR)—price indexes for the net output of selected industries and their products as calculated according to the Producer Price Index Revision.

World Bank Debt Tables (WDEBT)—data on the outstanding public and publicly guaranteed debts of developing countries for all lenders.

Energy

American Petroleum Institute Monthly Completion Report (APIMCR)—cumulative number of oil wells completed in the U.S., including the number of wells and footage drilled for oil wells, gas wells, and dry holes, further defined into exploratory, development, and total wells.

Australian Major Energy Statistics (AMES)—statistics of energy production and consumption in Australia as published by the Australian Department of Resources and Energy. The database is primarily concerned with petroleum products and includes series for production, sales, exports, imports, and stocks, broken down by fuel and state.

Austrian Energy Consumption Statistics (OEES)—Austrian energy consumption statistics by sector and source of energy.

Chemical Market Associates Petrochemical Market Reports (CMAI)—three analytical petrochemical reports issued each month, focusing on a critical dimension of the petrochemical marketplace.

DeWitt Petrochemical Newsletters (DEWITT)—weekly analytical reports, price quotations, and forecasts for a broad range of petrochemical products. Sixteen distinct newsletters and forecasts are available.

Hughes Rotary Drilling Rig Reports (HUGHES)—counts of exploratory drilling rigs worldwide.

Imports of Crude Oil and Petroleum Products (IMPORTS)—information about every shipment into the United States of crude oil and residual, unfinished, and finished petroleum products.

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▷ *Independent Chemical Information Services (ICIS)*—information relating to market activity for a range of chemical and petrochemical products as reported weekly by ICIS.

International Energy Annual (IEA)—data about production, supply, disposition, stocks, prices, product flow, reserves, imports, and exports for many of the major energy commodities in more than 190 countries, regions, and areas of special sovereignty, including statistics covering crude oil, nuclear energy, coal, natural gas, natural gas plant liquids, refined petroleum products, hydroelectric power, and refining capacity.

International Petroleum Annual (IPA6)—worldwide statistics on supply of, and demand for, crude petroleum and refined petroleum products.

Liquefied Petroleum Gas (LPGAS)—inventories of liquefied petroleum gases (LPGs) in all U.S. Petroleum Administration for Defense (PAD) districts.

London Oil Reports (LOR)—spot prices and market activity in Europe and the United States for a range of crude oil types and petroleum products.

Lundberg Survey Retail Prices (RETAIL)—retail prices for four grades of gasoline, as well as diesel and gasohol for over 17,500 fuel outlets in approximately 75 United States markets.

Lundberg Survey Share of Market (SOM)—sales volumes and percentage share of market for United States brands of gasoline, as calculated by Lundberg Survey Inc., using figures collected from all known sources.

Lundberg Survey Spot Product Assessment (LSPOT)—spot market assessments for gasoline jet kerosene, No. 2 fuel, 180 CST, and Bunker C at Chicago, Los Angeles Harbor, New York Harbor, and the Gulf Coast.

Lundberg Survey Wholesale Prices and Moves (WHOLESALE)—current and historical wholesale prices for gasoline and diesel as collected by Lundberg Survey Inc. There are 40,000 time series in the database.

Monthly Energy Review (MER)—several tables from the U.S. Department of Energy publication, *Monthly Energy Review.*

Organisation for Economic Co-operation and Development, Quarterly Oil Statistics (QOS)—information from the International Energy Agency of the OECD, including details on balance of production; trade; refinery input and output; final consumption; stock levels and changes for crude oil, natural gas liquids (NGLs), feedstocks, and nine product groups.

PETROFLASH! Crude and Product Reports (PETROFLASH)—two daily oil market reports covering spot price assessments on key world export crudes and the United States domestic-grade crudes, and a comprehensive appraisal of spot and contract product prices.

Petroleum Argus Daily Market Report (ARGREP)—daily reports from *Petroleum Argus* on spot prices for crude oil and petroleum products in leading European centers.

Petroleum Argus/Prices (ARGUS)—seven tables containing information extracted from the *Petroleum Argus Daily Market Report*, including spot prices for refined petroleum products for northwestern Europe and western Mediterranean; barge prices for petroleum products F.O.B. for Amsterdam, Rotterdam, and Antwerp; spot crude prices for Saudi light from Ras Tanura and Brent; daily spot crude prices for Brent, W. Texas Intermediate, Dubai, Arab light, and Arab heavy; freight costs for crude oil and petroleum products; official government price of Saudi Arabian crude oil; New York City spot product prices for gas oil and motor gasoline; Rhine barge and tank wagon prices at Rotterdam, the Ruhr, and Basle.

Petroleum Intelligence Weekly (PIW)— four data series from the *Petroleum Intelligence Weekly*: monthly volumes of crude oil for producers and major exporters, and totals of natural gas liquids for OPEC and the world (COP); broad trend of basic oil price indicators for three main types of crude in international trade (KCP); representative monthly spot prices for primary petroleum products in six key refining centers (SPP); official prices for 114 crudes (OCP).

Petroleum Marketing Monthly (PMM)—10 databases from the U.S. Department of Energy publication, *Petroleum Marketing Monthly.*

Reuters World Energy Pipeline (PIPELINE)—comprehensive, once-a-day roundup of world spot prices and commentary for crudes and products. Netback calculations are provided for topping and cracking refineries using all major available crudes in the U.S. Gulf, Singapore, northwestern Europe, and the Mediterranean. Included are product and crude buy and sell ranges in the spot market, as well as notification of confirmed deals.

Seismic Crew Count (CREW)—the monthly number of seismic land crews and marine vessels searching for oil and gas in the United States and United States waters, including Alaska.

State Energy Data System (SEDS)—statistics on energy consumption in the United States from the *State Energy Data Report*, published by the U.S. Department of Energy.

TECNON Petrochemical Newsletters (TECNON)—petrochemical newsletters and product reports providing information covering a wide range of products in the petrochemical industry.

United States Department of Energy Petroleum Supply Monthly (DOE)—information on stocks, production, and imports of crude oil and petroleum products and refinery operations in the U.S.

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U.S. Weekly Temperatures (HEATW)—weekly average temperatures reported by over 200 weather stations in the United States.

Weekly Statistical Bulletin (WSB)—information on crude oil and petroleum products and refinery operations in the United States.

Finance

Agricultural Commodities (AGDATA)—price and volume information on a number of key Canadian and U.S. agricultural commodities.

Australian Commodities (ACOMDAILY)—daily trading statistics, including prices, open position, and volume, for all commodities on the Sydney Futures Exchange.

Australian Financial Markets (ARATE)—daily market-based interest rates, exchange rates, and commercial bill rates; weekly series on Commonwealth government securities; and monthly series on semigovernment securities.

Australian Stock Exchange (AUSSTOCK)—current and historical prices and volumes for company securities trading on Australian Stock Exchange.

Australian Stock Exchange Indexes (ASE)—price and accumulation indexes from the Australian Stock Exchange.

Bank of Canada Weekly Financial Statistics (WBANK)—weekly banking and monetary statistics released by the Bank of Canada.

Canadian Chartered Banks, Monthly Statements of Assets and Liabilities (JSCHEDULE)—monthly statements of assets and liabilities, for each of the banks operating in Canada (month ended November 30, 1981 to the present).

Canadian Chartered Banks, Quarterly Income Statements (OSCHEDULE)—quarterly statements of income for each of the banks operating in Canada (quarterly, January 31, 1982 to the present).

Canadian Department of Insurance (DOIDB)—financial information on 600 federally registered insurance or trust companies, fraternal benefit societies, and cooperative credit associations across Canada.

The Canadian Oils Corporate Database (CANOILS)—more than 300 facts for each of over 200 Canadian oil and gas producers, including annual balance sheet, profit and loss statement, sources and uses statement, land, production, reserves, drilling activity, industry-specific ratios and calculated facts, plus many per share and per-$1,000 invested items.

Canadian Options (CDNOPTIONS)—daily trading statistics for put and call options traded in Toronto, Montreal, and Vancouver; issued by Trans Canada Options, Inc.

Commodities (COMMODITY)—prices, volumes, and open interest for all major commodities traded on the London, Paris, New York, Chicago, Kansas City, Minneapolis, Amsterdam, Singapore, Tokyo, Hong Kong, Winnipeg, and Toronto/Montreal futures markets.

Commonwealth Bank Bond Index (COMMBOND)—price, income, and accumulation indexes showing the progress of Australian government bonds in the secondary market for Commonwealth government bonds.

Commodity Options (COMOPTIONS)—prices, volumes, and open interest for all major options on commodity futures traded in the U.S., in the form of "life of contract" series.

Daily Currency Exchange Rates (CURRENCY)—currency exchange rates for major world currencies as reported on the major markets around the world: Copenhagen, Frankfurt, Helsinki, London, Madrid, Melbourne, New York, Oslo, Paris, Singapore, Tokyo, Toronto, Vienna, and Zurich. Rates are reported in the currency of the reporting country. Forward rates and spot rates are reported by the Copenhagen, London, Melbourne, New York, and Toronto markets.

Danish Securities Data (DKSEC)—daily price and volume statistics for all stocks, bonds, and related securities traded on the Copenhagen Stock Exchange, including several stock indexes and bond yield averages.

Disclosure Online (DISCLOSURE)—current and historical corporate statistics, including balance sheets and income statements, as well as textual information for more than 12,000 publicly owned companies that have filed with the U.S. Securities and Exchange Commission (SEC).

Dow Jones News/Retrieval (DOW)—a comprehensive news, business, and investment service, comprised of more than 30 individual databases. Users are able to store, manipulate, analyze, print, and display information obtained from the service.

EXSHARE International Securities Information (EXSHARE)—daily pricing, dividend, earnings, and capitalization information for over 50,000 securities listed on approximately 50 exchanges in Great Britain, Western Europe, Australia, Japan, South America, and South Africa. Eurobonds, currency exchange rates, and indexes are also included. Other descriptive financial information is available for many securities.

Financial Post Bonds (FPBOND)—weekly closing prices and yields on more than 1,500 Canadian bonds. Coverage includes all publicly issued Canadian, Provincial, Provincial guaranteed, and corporate bonds, as well as many private placements.

Financial Post Canadian Corporate Data (FPCORP)—financial data covering most of the companies in the Tor-

▷ onto Stock Exchange 300 Composite Index and others chosen for their growth and interest to investors.

Financial Post Securities (FPSTOCK)—stock market trading statistics for securities listed on Canadian exchanges. Data is a composite of that contained on the Montreal, Toronto, Calgary, and Vancouver exchanges.

Foreign Currency Projections (FXPRO)—a foreign currency forecasting service provided by S.J. Rundt and Associates, Inc.

Hong Kong Stock Exchange (HKSTOCK)—daily high, low, and close prices and volumes for over 135 securities traded on the Hong Kong Stock Exchange.

Metal and Mineral Prices (MINPRI)—daily metal prices for eight major metals (silver, aluminum, gold, copper, nickel, lead, tin, and zinc) in a total of 32 price series.

Money Market Rates (MRATE)—money market, interest, and Eurocurrency rates for several countries.

North American Stock Market (NASTOCK)—prices and volumes for securities listed on six North American Stock Exchanges.

Standard & Poor's MarketScope (MARKETSCOPE)—S&P MarketScope is an on-line information service providing dynamically updated information on over 4,700 American public corporations.

Stock Exchange of Singapore (SINGSTOCK)—daily trading statistics for the stocks traded on the Singapore Stock Exchange.

Sydney Stock Exchange STATEX Service (STATEX)—balance sheet and income information for all major companies listed on the Sydney Stock Exchange.

Toronto Stock Exchange 300 Index and Stock Statistics (TSE300)—trading statistics for the 300 stocks and 63 indexes that form the Toronto Stock Exchange 300 Composite Index.

United States Bonds (USBOND)—daily trading statistics for over 5,000 listed bonds and government and agency issues.

United States Options (USOPTIONS)—daily trading statistics for all put and call options traded on the U.S. option exchanges.

United States Stock Market (USSTOCK)—current and historical price and volume statistics for securities listed on U.S. stock exchanges and over-the-counter markets.

Miscellaneous

Actuarial Data Base (ACT)—primitive mortality information on assured lives, annuitants, and general populations, taken from over 200 published tables.

National Emergency Equipment Locator System (NEELS)—information on the nearest suitable equipment and material for combating spills of oil or hazardous material.

MICROCOMPUTER SOFTWARE/ SERVICES

Sharp APL/PCX is a complete implementation of Sharp APL for the IBM family of personal computers. It is virtually identical to the APL offered on I.P. Sharp's timesharing service.

Sharp APL/PCX is designed to operate on the IBM AT/370 and the IBM XT/370 Personal Computers, making full use of the 370-type architecture as found on large mainframes. According to I.P. Sharp, this results in a dramatic performance improvement over many other systems developed for less powerful machines. The user need not purchase the IBM VM/PC product in order to run Sharp APL/PCX; it will run on the IBM PC/AT/XT, PS/2, or compatibles, just like Sharp APL/PC.

Similar to Sharp APL/PCX, the Sharp APL/PC product is designed to operate on IBM PC/AT/XT, PS/2, and compatibles. Sharp APL/PC offers a programming environment that is virtually identical to that of I.P. Sharp's PCX product and is ideal for application development.

Sharp APL/PC will run on IBM AT/370 or IBM XT/370 Personal Computers, although the execution speed will be slower since this product cannot take advantage of special hardware in those machines.

MICROCOMM provides access to a powerful and extensive range of mainframe software packages and databases. Users can extract data from the I.P. Sharp databases or their own private library. Users can transfer (download) data to an IBM PC file; store and display it in a variety of formats; and transfer (upload) data from the IBM PC to the I.P. Sharp system. Microcomm transmits data in formats that can be used by a variety of spreadsheet products, including Lotus 1-2-3.

FUTURE PLANS

I.P. Sharp's research and development activities center on software products that promote the integration of its network with its data and software. High-profile applications that take advantage of its expertise in building complex systems will continue to be a major aspect of I.P. Sharp's business. ☐

Mead Data Central

COMPANY INFORMATION

Mead Data Central, Inc.
P.O. Box 933
Dayton, Ohio 45401 (513) 865-6800, (800) 227-4908

UPDATE: *Mead Data Central Inc. has continued to add more databases to its* LEXIS *and* NEXIS *services and has increased its revenues. They have also acquired two more companies—the Michie Company, a legal publisher of regulatory materials, treatises, state statutes, and other legal reference books; and Jurisoft, Inc., a leading publisher of legal software including CiteRite II, which checks the format of legal citations in word processing documents.*

Company Background

Mead Data Central, Inc. (MDC), a leading provider of full-text, on-line information, was formed in 1970. With more than 3,400 employees, MDC maintains offices in the United States, the United Kingdom, and Canada. It also has distributors in Australia, Brazil, and Japan. It is a wholly owned subsidiary of the Mead Corporation, the $4.5 billion forest products giant.

Its original offering, the LEXIS on-line legal information service, is one of the on-line industry's greatest successes. In 1988, LEXIS and NEXIS, the news and business information service, produced revenues of $307.6 million.

The LEXIS service provides the full text of court decisions from 50 states and the District of Columbia, as well as state statutes and libraries of French and British law. Extensive files of federal case law are organized by legal specialty (e.g., tax, securities, and insurance).

In 1980, MDC introduced NEXIS and subsequently broadened its user base from lawyers and accountants to journalists, businesspeople, financial analysts, and other professionals needing up-to-the-minute news and background information. NEXIS, an on-line full-text news and general information search and retrieval service, includes the full text of national and international newspapers, wire services, magazines, newsletters, and government publications.

Mead Data Central's completed campus facility near Dayton, Ohio.

Mead Data Central, Inc. (MDC), a subsidiary of Mead Corporation, is best known for its LEXIS on-line legal information service, introduced in 1973. The most successful service of its kind, LEXIS is a fixture in many lawyers' offices. NEXIS, MDC's other major on-line service, provides full-text information from more than 650 business, financial, technical, and news magazines; newspapers; newsletters; wire services; and broadcast transcripts. Sources include *The New York Times, Los Angeles Times, The Washington Post, Forbes, Fortune, Business Week*, the AP, and UPI.

MDC's other on-line services include the *LEXIS Financial Information Service*, which provides company and industry information; the *MEDIS* service, which contains the full text of more than 40 current medical journals and textbooks; and the *National Automated Accounting Research System (NAARS)*, a library of annual reports, proxy statements, reports from the American Institute of Certified Public Accountants; the *LEXIS Country Information Service* with frequently updated news from around the world, and the *AP Political Service* for political news and profiles.

Over 200,000 professionals in more than 45 countries now use MDC's services. Subscribers can access MDC's databases through terminals and most personal computers, including equipment from IBM, AT&T, Apple, Wang, Digital Equipment Corporation, and Hewlett-Packard.

REPORT HIGHLIGHTS: **PAGE**
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Descriptions of other MDC services follow:

The *LEXIS Financial Information Service* provides company and industry information from leading brokerage firms, filings with the Securities and Exchange Commission, business news, economic forecasts, and earnings projections.

LEXPAT is a computer-assisted patent research service that contains the full text of more than 1,000,000 U.S. pat-

Mead Data Central

▷ ents issued since 1975. About 75,000 new patents are added each year, usually within six days of issue.

The *LEXIS Private Database* services provide litigation support files, private libraries, and other proprietary databases for large law firms and corporations.

The *MEDIS* service contains the full text of more than 40 medical journals and textbooks. It also contains the National Library of Medicine's *Medline* database, the preeminent biomedical database, featuring citations from thousands of clinical and research journals.

The *National Automated Accounting Research Service (NAARS)* is a library of annual reports, proxy statements, and reports of the American Institute of Certified Public Accountants.

The LEXIS Country Information Service contains analysis of reports by country, region, and topic including an alert wire with news updated every three hours.

The Associated Press Political Service contains information on elections, political issues, polls, and candidates.

Mead Data Central's delivery system is the common denominator shared by each of the company's services. Through this system, users at terminals or personal computers search through massive databases (the computer center in Dayton houses more than 202.2 *billion* text characters) via a free-text searching system. The computer searches every word of every case, article, or story in the database selected by the user and retrieves all sources containing the word or series of words specified by the user. Documents retrieved are displayed on a video screen in any of several formats selected by the user. Hard copy can be printed for any search or portion of a search.

MDC also offers subscribers special terminals designed to make MDC's services easily accessible. In 1983, MDC and IBM initiated a marketing agreement, making MDC's extensive database accessible via the IBM Personal Computer, the Displaywriter, and the IBM 3101 terminal. The agreement marked the first time that MDC's databases were commercially available on terminals/systems other than those manufactured by the information retrieval service. Since then, MDC has formed marketing agreements with several other hardware manufacturers. MDC's databases are now easily accessible through virtually any personal computer or minicomputer.

MDC recently completed a $37 million capital expansion program that more than doubled the size of its headquarters. The campus plan included the construction of two new office buildings, a system of interconnected covered walkways, and the expansion and renovation of the company's main computer facility.

Competitive Position

Mead Data Central, a subsidiary of Mead Corporation, is one of the on-line industry's most successful vendors in terms of revenues and number of subscribers. It offers two primary services, LEXIS and NEXIS. LEXIS, an on-line service for lawyers, introduced in 1973, was MDC's first service. It still provides the bulk of its revenues.

LEXIS has only one competitor, West Publishing's Westlaw service. LEXIS has perhaps 75 percent of the market for computerized legal services; however, Westlaw is reportedly gaining. It is unlikely, however, that it will overtake LEXIS, particularly in light of the recent settlement between the two companies. This gives MDC the right to use "star paging" page citations in LEXIS, a referencing method that West originated. MDC must, however, pay a licensing fee to rival West.

While LEXIS is now used by most large law firms, many smaller firms have yet to commit to either LEXIS or Westlaw, making the growth potential large. In fact, the legal research market, now worth $260 million, is expected to grow at an annual rate of 20 to 30 percent.

NEXIS, Mead Data Central's on-line news retrieval service, has more competitors than LEXIS. While NEXIS had the full-text market more or less to itself when it debuted in 1979, today more and more database vendors are adding full text sources in response to the booming end-user market. DIALOG, for example, which offers more than 320 databases, is adding more full-text files. More than 45 of its files now feature "complete text records." (DIALOG became an even more formidable competitor in mid-1988 when Knight-Ridder bought it. Knight-Ridder already owned another NEXIS competitor, VU/TEXT, the leading on-line newspaper vendor.) Other NEXIS competitors include NewsNet, an on-line vendor of more than 350 newsletters; and DataTimes, which specializes in newspapers but also offers a gateway to Dow Jones News/Retrieval (yet another competitor).

In spite of ever-increasing competition, NEXIS recently turned the corner to profitability. MDC is working hard to strengthen NEXIS by increasing the number of publications available through the service and making the information easier to find. Examples of newly signed publications licenses for NEXIS include the *London Daily Telegraph*, *Boston Globe*, *Newsday*, and the *Federal News Service*. Also, NEXIS is making its vast information holdings easier to retrieve by organizing the information into distinct libraries containing related publications. Examples of such libraries are the Advertising and Public Relations Library, the Person Group file, and the International Group.

Finally, another factor contributing to NEXIS' current and future success is the performance of its parent company, Mead Corporation. A leader in forest products as well as electronic publishing, Mead had record earnings in 1988 and continued that pace into 1989.

- Atlanta, GA
- Austin, TX
- Baltimore, MD
- Boston, MA
- Century City, CA
- Chicago, IL
- Cincinnati, OH
- Cleveland, OH
- Columbus, OH
- Costa Mesa, CA
- Dallas, TX
- Dayton, OH
- Denver, CO
- Detroit, MI
- Greensboro, NC
- Honolulu, HI
- Houston, TX
- Indianapolis, IN
- Kansas City, MO
- Little Rock, AR
- Los Angeles, CA
- Louisville, KY
- Miami, FL
- Milwaukee, WI
- Minneapolis, MN
- New Orleans, LA
- New York, NY
- Oklahoma City, OK
- Omaha, NE
- Philadelphia, PA
- Phoenix, AZ
- Pittsburgh, PA
- Portland, OR
- Raleigh, NC
- Richmond, VA
- Rochester, NY
- Sacramento, CA
- St. Louis, MO
- St. Paul, MN
- Salt Lake City, UT
- San Francisco, CA
- San Diego, CA
- San Jose, CA
- Seattle, WA
- Stamford, CT
- Tampa, FL
- Washington, DC
- Toronto, Ontario
- London, England

Table 1. Mead Data Central's major sales office locations.

RESOURCES AND FACILITIES

Processing Center

MDC's computer center in Dayton, Ohio houses all of its data banks. MDC uses a multimillion dollar Amdahl mainframe configuration. More than a thousand users can access MDC's services simultaneously.

Customer Support Services

MDC offers an instruction course designed to give users all the fundamental skills required to access its services. MDC also operates a toll-free customer service telephone number, 24 hours a day on weekdays, weekends, and holidays. In addition, MDC offers customer documentation including library guides, monthly newsletters, applications brochures, and training diskettes. MDC also offers a wide variety of technical support to users seeking to connect their equipment to MDC services.

Sales and Marketing Services

Mead Data Central maintains over 50 sales offices. Table 1 lists the major office locations.

APPLICATION-SPECIFIC SERVICES

MDC provides computer-assisted information retrieval principally through LEXIS and NEXIS.

LEXIS includes an extensive full-text collection of general federal laws, as well as specialized law libraries in:

- Admiralty (ADMRTY)
- American Bar Association
- Banking, federal (BANKNG)
- Bankruptcy, federal (BKRTCY)
- Bureau of National Affairs, The (BNA)
- CCH Blue Sky Law Reporter (CCHSKY)
- Commerce Clearing House (CCH)
- Communications, federal (FEDCOM)
- Corporate law (CORP)
- Corporation information, state (INCORP)
- Employment law, state (EMPLOY)
- Energy, federal (ENERGY)
- Environmental law (ENVIRN)
- Health law (HEALTH)
- Insurance law, state (INSRLW)
- Labor, federal (LABOR)
- Military justice (MILTRY)
- Patent, trademark, and copyright (PATCOP)
- Public contracts, federal (PUBCON)
- Public utilities law (UTILTY)
- Securities, federal (FEDSEC)
- Securities, state (STSEC)
- Tax, federal (FEDTAX)
- Tax, state (STTAX)
- Trade, international (ITRADE)
- Trade regulation, federal (TRADE)
- Transportation, federal (TRANS)

Subscribers to LEXIS can also access:

- Auto-Cite (a service of Veralex, Inc., the electronic affiliate of the Lawyers Cooperative publishing company, Bancroft-Whitney company, and the Research Institute of America, Inc.)
- Shepard's Citations (made available under an agreement with Shepard's division of McGraw-Hill, Inc.)
- *American Law Reports (ALR)*, a product of the Lawyer's Cooperative publishing company and Bancroft-Whitney company.

A new LEXIS subscriber pays a onetime charge if using a dedicated LEXIS terminal. (There is no installation charge if using customer-provided equipment.) Thereafter, MDC charges a monthly library access fee and a monthly equipment fee for each LEXIS terminal. Connect time charges are computed from the time the user transmits an identification number until sign-off.

In 1986, MDC introduced a program of LEXIS Membership Groups, which allows users to access LEXIS via bar associations and law libraries without incurring any "overhead" charges. Over 1,000 law firms now use LEXIS via this program.

MDC has instituted an approach to pricing which, it claims, is designed to improve research results by making search charges predictable and reading or printing answers on-line more affordable. Connect time is $22 per hour. Search charges are fixed and depend on the value and amount of information in the file or group of files accessed.

Mead Data Central

Prices range from $6 to $35 per search. MDC offers volume discounts based on the number of searches conducted in a given month. Searches can be modified at no additional cost.

MDC's services are available all hours, Monday through Friday, except from 2:00 a.m. to 2:15 a.m. (EST) and from 10:00 p.m. Saturday to 6:00 a.m. Sunday (EST). Auto-Cite access is available Sunday through Friday from 8 a.m. to midnight (EST) and from 10 a.m. to 10 p.m. (EST) on Saturday.

NEXIS is a computer-assisted information retrieval service that provides instant access to the full text of stories from leading general and business newspapers, magazines, wire services, newsletters, and structured databases, along with other information sources. NEXIS subscribers can customize their searches by combining individual or group files. Subject group files include news, finance, and business. NEXIS also incorporates abstracts of articles that comprise The New York Times Information Bank. In 1983, MDC acquired the exclusive license to distribute *The New York Times* in full text and The Information Bank.

NEXIS subscribers pay a monthly subscription charge, connect time and telecommunications charges, and per-search charges. Telecommunications charges are $12 to $17 per hour, depending on whether subscribers use MeadNet, Telenet, Tymnet, or WATS. Per-search charges range from $6 to $35. There is an extra charge for leased equipment and off-line printing.

NETWORKING SERVICES

Access to LEXIS, NEXIS, and other MDC services is available via MeadNet, a privately owned, high-speed telecommunications network provided to subscribers by Mead Data Central. Access is also available through Telenet, Tymnet, IBM Information Network, Wang Pac, or WATS. MDC's dedicated terminals are equipped for use with voice grade lines.

ON-LINE DATABASES

Additional information on most of these databases may be found in the On-line Databases section (Tab OL40) of this publication.

LEXIS

LEXIS includes an extensive full-text collection of general federal laws, with decisions from all federal courts, the United States Code, *American Law Reports (ALR)*, and specialized federal law libraries. LEXIS also includes the case law of all 50 states and the District of Columbia; Delaware Corporation cases; United Kingdom law libraries, made available under an agreement with Butterworth (Telepublishing) Ltd.; French law libraries, made available under an agreement with Tele Consulte, a subsidiary of Gaumant; Auto-Cite, a service of the Lawyer's Cooperative Publishing Company and its affiliate, Bancroft-Whitney; and Shepard's Citations.

In addition, LEXIS contains:

- The Federal Register (from July 1980 to the present)
- The Code of Federal Regulations
- Briefs submitted to the Supreme Court of the United States for cases argued before the Court
- State Blue Sky laws and regulations, decisions, news, and related material published by the Commerce Clearing House, Inc.
- The Incorp library of corporation information from the offices of the California, Illinois, Missouri, and Texas secretaries of state.
- *American Maritime Cases* (dating from 1923)
- Insurlaw files: materials from the National Insurance Law Service, including statutes and regulations of 50 states and other insurance information.

Recent Enhancements Facilitating Use:

Command Stacking—lets users obtain law-related materials without learning several different search protocols or signing off one service to gateway to others. By stacking commands, users can save time by bypassing unneeded menus. This feature also allows for custom file selection, permitting the searcher to limit the search to relevant states such as Arizona, New Mexico, and California.

LEXSEE—this feature enables researchers to find the full text of cases, annotations, law review articles, and IRS Private Letter Rulings and Revenue Procedures by simply entering the citation. Thus, the user need not select a new library and file.

LEXSTAT—enables researchers to retrieve statutory sections by citation by any location in the LEXIS service, without changing libraries or doing a new search.

Browse Feature—permits users to page back and forth within statutes, checking preceding and following sections for essential information at the browse charge of about $0.53 per minute.

Ability to Modify a Search—via the *Eclipse* feature, users can give a standing order to the computer service to watch for certain items concerning specific clients or issues and automatically have reports sent daily, weekly, or monthly. These searches can now be modified on-line.

The NEXIS Library

NEXIS is a full-text, computer-assisted, information retrieval database that provides quick access to stories from more than 650 of the world's leading general and business newspapers, magazines, wire services, newsletters, and

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MAGAZINE FILES

Filename	Description
MAGS	Group file of all magazines
ABABJ	ABA Banking Journal from January 1980
ABM	Alaska Business Monthly from January 1986
ADV	Advantage from January 1985
ADMIN	Administrative Management (formerly Office Administration & Automation) from February 1983
ADWEEK	ADWEEK from January 1984
AEROAM	Aerospace America from January 1984
AIRWLD	Air Transport World from January 1983
AMERLB	American Libraries from January 1983
AMLAWR	The American Lawyer from January 1987
APLUS	A+ from January 1984
ARIZ	Arizona Business Gazette from June 1986
ASIA	Asia Pacific Business from June 1986
ATLANT	The Atlantic from January 1983
AUTOIN	Automotive Industries from January 1983
AUTOMA	Automation (formerly Production Engineering) from January 1983
AUTOMK	Automotive Marketing from January 1983
AUTOWK	AutoWeek from October 1988
AVWEEK	Aviation Week & Space Technology from January 1975
AZTR	Arizona Trend from January 1986
BAL	Business Atlanta from May 1985
BBJ	Boston Business Journal from January 1986
BBM	Boston Business from March 1987
BCB	BC Business from February 1985
BCKSTG	Back Stage from August 1984
BDCC	Business Digest of the Cape and Islands from May 1988
BDDV	Delaware Valley Business Digest from January 1985
BDMA	Business Digest of Southeastern Massachusetts from July 1988
BJM	Metropolitan Toronto Business Journal from May 1985
BNC	Business—North Carolina from February 1985
BNKADM	The Magazine of Bank Administration from January 1981
BNKREG	Issues in Bank Regulation from Winter 1981
BRB	The Greater Baton Rouge Business Report from July 1986
BRCAST	Broadcasting from January 1983
BRLIFE	Best's Review—Life-Health Insurance Edition from January 1983
BRPROP	Best's Review—Property-Casualty Insurance Edition from January 1983
BUSAMR	Business America from January 1983
BUSAV	Business & Commercial Aviation from January 1983
BUSMTH	Business Month from January 1975
BUSWK	Business Week from January 1975
BVM	Business View from August 1985
BWOR	Business Worcester from February 1986
BYTE	BYTE from January 1982
CAEX	The California Executive from October 1987
CANBUS	Canadian Business from January 1983
CARDRV	Car and Driver from January 1988
CBR	Intercorp from January 1986
CDBR	Capital District Business Review from February 1987
CHEMEN	Chemical Engineering from January 1981
CHEMWK	Chemical Week from January 1975
CMPBNK	Computers in Banking from January 1988
CMPDEC	Computer & Communications Decisions (formerly Computer Decisions) from January 1983
CMPDGN	Computer Design from January 1988
CMPLIB	Small Computers in Libraries from January 1988
COAL	Coal (formerly Coal Age) from January 1981
COLO	Colorado Business from June 1986
CONELC	Consumer Electronics from January 1983
CONSMR	Consumer Reports from January 1988
CRKC	The Corporate Report—Kansas City from November 1986
CRMN	The Corporate Report—Minnesota from October 1987
CSAEXC	Chain Store Age Executive from January 1983
CSAMRC	Chain Store Age, General Merchandising Trends from January 1983
DALL	Dallas Magazine from January 1986
DATA	Data Communications from January 1982
DATAMA	Datamation from January 1983
DBW	Denver Business from January 1985
DEFELC	Defense Electronics from January 1982
DENV	The Denver Business Journal from October 1986
DFA	Defense & Foreign Affairs from January 1981
DRUGTP	Drug Topics from January 1983
DSNEWS	Discount Store News from February 1983
DSTBUT	Distribution from January 1983
ECON	The Economist from January 1975
ELCBUS	Electronic Business from January 1988
ELCDES	Electronic Design from January 1983
ELCLRN	Electronic Learning from January 1988
ELECTR	Electronics from January 1981
EMJ	Engineering and Mining Journal from January 1981
ENR	Engineering News—Record from January 1981
ERTHRV	Whole Earth Review from May 1985
ESD	ESD: Electronic System Design Magazine from January 1988
EURMON	Euromoney from January 1985
EXEC	Executive Report from January 1985
FINWLD	Financial World from January 1983
FLOR	Florida Trend from July 1986
FOC	Focus from January 1985
FOLIO	Folio: The Magazine for Magazine Management from November 1984
FOOD	Food & Nutrition from April 1984
FORAFR	Foreign Affairs from 1981
FORBES	Forbes from January 1975
FORTUN	Fortune from January 1977
FOUNDR	Foundry Management & Technology from February 1983
GEOR	Georgia Trend from July 1986
GRAPH	Graphic Arts Monthly from January 1983
HAMP	Business New Hampshire from August 1986
HBR	Harvard Business Review from January 1976
HEALTH	Health from January 1983
HFDNWS	HFD—The Weekly Home Furnishings Newspaper from January 1983
HIB	Hawaii Business from January 1985
HITECH	High Technology Business from September 1981
INC	Inc. from June 1981
INDB	Indiana Business from January 1985
INDWK	Industry Week from January 1981
INFSYS	Infosystems from December 1984
INVEST	Institutional Investor from January 1988
JSMBUS	Journal of Small Business Management from July 1984
KBN	Kansas Business News from October 1987
LAM	Los Angeles Magazine from June 1988
LIFE	Life from January 1982
LOTUS	Lotus Magazine from January 1988
LOU	Louisville from January 1985
MACDSN	Machine Design from January 1983
MACUSR	MacUser from January 1988
MAN	Manitoba Business from January 1985
MCB	Mercer Business from April 1985
MCLEAN	Maclean's from January 1985
MECHEN	Mechanical Engineering from January 1982
MICH	Michigan Business from July 1986
MICSYS	Microwave Systems News & Communications Technology from January 1982
MIL	The Business Journal—Milwaukee from October 1985
MINJNL	Mining Journal from January 1981
MINMAG	Mining Magazine from January 1981
MINREV	Mining Annual Review from 1981
MMDEC	Marketing and Media Decisions from January 1983
MMSYS	Mini-Micro Systems from January 1988
MONEY	Money from January 1982
MOTECH	Modern Office Technology from January 1983
MTLNWS	Metalworking News (includes Iron Age) from January 1983
NATION	The Nation from January 1984

Table 2. Magazine files available through MDC's NEXIS library as of spring 1989.

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Filename	Description
NEB	New England Business from April 1985
NEWB	Sarasota Magazine (formerly New Business) from May 1985
NEWLDR	The New Leader from May 1985
NEWREP	The New Republic from January 1983
NJS	New Jersey Success from January 1985
NMEX	New Mexico Business Journal from January 1985
NTLJNL	National Journal from January 1977
NTNBUS	Nation's Business from January 1983
NTNREV	National Review from January 1983
NTNRST	Nation's Restaurant News from February 1983
NUNEWS	Nuclear News from January 1982
NWEEK	Newsweek from January 1975
OAK	Oakland Business from January 1986
OFFSHR	Offshore from January 1980
OHB	Ohio Business from March 1985
OHIO	Ohio from January 1986
OILGAS	Oil & Gas Journal from January 1978
OPTINF	Optical Information Systems from January 1988
OREG	Oregon Business from March 1987
OSB	Ocean State Business from January 1986
PBJ	The Business Journal—Phoenix & the Valley of the Sun from January 1986
PC	PC Magazine from January 1985
PCWEEK	PC Week from August 1983
PEOPLE	People from December 1981
PERSNL	Personal Computing from January 1988
PETNWS	National Petroleum News from January 1983
PLTENG	Plant Engineering from January 1983
POPSCN	Popular Science from January 1983
PNE	Pacific Northwest Executive from October 1986
POLICY	Policy Review from Winter 1986
PRJNL	Public Relations Journal from January 1983
PROGAR	Progressive Architecture from January 1983
PROGGR	Progressive Grocer from January 1983
PSYTDY	Psychology Today from September 1985
RD	Research & Development from January 1983
RSTBUS	Restaurant Business from January 1983
SAC	The Business Journal—Sacramento from December 1985
SASK	Saskatchewan Business from January 1985
SCIAMR	Scientific American from January 1983
SEAT	Seattle Business from February 1986
SEPOST	Saturday Evening Post from January 1983
SLBJ	St. Louis Business Journal from May 1985
SMMGMT	Sales & Marketing Management from January 1983
SMTHSN	Smithsonian from January 1983
SOAP	Soap—Cosmetic—Chemical Specialities from January 1983
SOFTNW	Software Magazine from January 1988
SPORTS	Sports Illustrated from December 1981
STEREO	Stereo Review from January 1983
SUPNWS	Supermarket News from January 1983
TECHRV	Technology Review from January 1983
TIME	Time from January 1981
TPHNY	Telephone from January 1988
TPT	TPT-Telecommunications Products & Technology from January 1988
TRANS	Transportation & Distribution (formerly Handling & Shipping Management) from January 1983
TRVWKY	Travel Weekly from January 1983
UNCHRN	UN Chronicle from January 1983
UNESCO	UNESCO Courier from January 1983
UNIX	UNIX Review from January 1988
USBANK	United States Banker from January 1983
USNEWS	U.S. News & World Report from January 1975
WARDS	Ward's Auto World from January 1983
WASHQR	The Washington Quarterly from Winter 1982
WSCMP	Wall Street Computer Review from January 1988
WSHMTH	Washington Monthly from July 1985
WWOMAN	Working Woman from January 1983

Table 2. (Continued)

other information sources. NEXIS subscribers include corporations, broadcasters, newspapers, banks, brokerage houses, universities, manufacturers, public relations and advertising agencies, lawyers, accountants, judges, government agencies, and trade and labor associations.

Tables 2 through 5 detail the magazines, newspapers, newsletters, and wire services available through the NEXIS services. Other databases available through NEXIS include:

ASAP II Files—a group file containing selected full-text articles from more than 80 publications from *Magazine ASAP II* and *Trade and Industry ASAP II.*

Business Dateline—a group file containing selected full-text articles from more than 120 regional business sources.

In addition, materials from these sources and the sources detailed in Tables 2 through 5 are also grouped into distinct "files," as follows:

Business Files (BUS)—a group file of publications and wire services that primarily cover general business.

Finance Files (FIN)—a group file of publications that primarily cover financial markets and investing.

Government Files (GOVT)—a group file of publications and wire services that primarily cover government and defense.

International Files (INTL)—a group file of publications and wire services that primarily cover foreign affairs.

Person Information Files (PERSON)—a group file of publications and wire services that primarily cover biographical and general news of individuals in business, politics, and the news.

Trade/Technology Files (TRDTEC)—a group file of publications and wire services that primarily cover a trade, science, or technology.

Abstracts Files (ALLABS)—a group file containing abstract information from business, general news, marketing, and financial sources. This file contains distinct databases not available through other NEXIS libraries. These databases include:

ABI/INFORM (ABI)—a business and management database containing abstracts from 1971 onward.

The Information Bank (ABS)—abstracts from newspapers, magazines, and journals from January 1979 onward.

Mead Data Central

NEWSPAPER FILES

File Name	Description
PAPERS	Group file of all newspapers
ABC	Atlanta Business Chronicle from January 1985
ADAGE	Advertising Age from January 1986
AFLCIO	American Federationist (AFL-CIO News) from March 1984
AJC	Alaska Journal of Commerce from February 1985
AMBANK	American Banker from January 1979
ARK	Arkansas Business from April 1987
AUST	Austin Business Journal from January 1985
AUTONW	Automotive News from October 1988
BALT	Baltimore Business Journal from January 1986
BBCSWB	BBC Summary of World Broadcasts and Monitoring Reports from January 1979
BDCP	Lancaster-Reading Business Digest from January 1985
BDLV	Lehigh Valley Business Digest from January 1985
BDSN	Southern New Jersey Business Digest from January 1985
BFC	Business First—Columbus from April 1985
BFL	Business First—Louisville from January 1985
BGLOBE	The Boston Globe from September 1988
BILL	Billings Business Journal from June 1986
BIZ	The Billings Gazette from February 1988
BJGR	Grand Rapids Business Journal from June 1985
BJNJ	Business Journal of New Jersey from September 1985
BNDBYR	The Bond Buyer from January 1981
BREC	Business Record from May 1985
BUFF	Business First—Buffalo from February 1985
BUSINS	Business Insurance from October 1988
BUTO	Business Today from June 1987
CBC	Cincinnati Business Courier from January 1985
CCLE	Crain's Cleveland Business from January 1986
CDET	Crain's Detroit Business from January 1986
CDSP	The Current Digest of the Soviet Press from June 1983
CHAR	The Business Journal—Charlotte from July 1987
CHIBUS	Crain's Chicago Business from January 1986
CHTRIB	Chicago Tribune from November 1988
CIBJ	Cincinnati Business Journal from February 1985
CMPSFT	Computer & Software News from January 1988
CMPWLD	Computerworld from January 1982
CNYJ	Central New York Business Journal from March 1987
COUR	The Courier-Journal from February 1988
CSM	The Christian Science Monitor from January 1980
DFW	Dallas-Fort Worth Business Journal from January 1987
DGTREV	Digital Review from January 1988
DMNEWS	DM News from February 1985
DSBL	Dayton-Springfield Business Life from February 1987
EDN	EDN from January 1988
ELCNWS	Electronic News from March 1983
EMEDIA	Electronic Media from January 1988
ENRNWS	Energy User News from January 1983
FACTS	Facts on File World News Digest from January 1975
FINTME	Financial Times from January 1982
FTNEWS	Footwear News from January 1983
GOVCMP	Government Computer News from Jaunuary 1988
HART	The Business Journal—Greater Hartford & New Haven from November 1987
HBJ	Houston Business Journal from February 1985
IBJ	Indianapolis Business Journal from January 1985
INFWLD	InfoWorld from July 1983
JACK	The Business Journal—Jacksonville from November 1987
JEJ	The Japan Economic Journal from June 1980
Filename	**Description**
JJB	Jackson Journal of Business from May 1985
JOSE	The Business Journal—San Jose from October 1985
KCBJ	Kansas City Business Journal from October 1987
LABJ	Los Angeles Business Journal from August 1987
LAT	Los Angeles Times from January 1985
LGLTME	Legal Times from January 1982
MACLEH	The MacNeil/Lehrer NewsHour from January 1982
MAGRWK	Manchester Guardian Weekly from January 1981
MBJ	Memphis Business Journal from March 1985
MISS	Mississippi Business Journal from January 1986
MNCB	Minneapolis-St. Paul CityBusiness from March 1985
MNLAWR	Manhattan Lawyer from September 1987
NASH	Nashville Business Journal from July 1987
NCNR	Greensboro News & Record from April 1988
NEWSDY	Newsday from May 1988
NHBR	New Hampshire Business Review from May 1985
NOCB	New Orleans CityBusiness from April 1985
NONT	Northern Ontario Business from January 1985
NTLAWJ	The National Law Journal from January 1983
NWW	Network World from March 1986
NYBUS	Crain's New York Business from January 1986
NYT	The New York Times from June 1980
OCBJ	Orange County Business Journal from January 1985
PBN	Pacific Business News from January 1985
PBT	Pittsburgh Business Times & Journal from January 1985
PENINV	Pensions & Investment Age from January 1987
PHIL	Philadelphia Business Journal from July 1985
PORT	The Business Journal—Portland from December 1984
PROV	The Providence Journal—Bulletin from February 1988
PSBJ	Puget Sound Business Journal from January 1985
REG	Regardie's The Business of Washington from February 1988
ROCH	Rochester Business Journal from November 1987
SABJ	San Antonio Business Journal from January 1987
SCB	Southern California Business from February 1985
SCBJ	Southern Connecticut Business Journal from November 1987
SDBJ	San Diego Business Journal from April 1985
SFBT	San Francisco Business Journal from January 1987
SFLA	South Florida Business Journal from January 1985
SMBD	Southern Maine Business Digest from April 1987
SPB	Shreveport Business from September 1985
SPRN	Springfield Business Journal from August 1987
SYRA	Syracuse Business from January 1985
TBC	Tulsa Business Chronicle from February 1985
TBT	The Business Times from February 1985
TELEGR	The Daily/Sunday Telegraph from September 1988
TOL	Toledo Business Journal from May 1987
TULS	Tulsa World from February 1988
VBW	Vermont Business Magazine from January 1986
VEGA	Las Vegas Business Press from May 1986
WBJ	Washington Business Journal from January 1985
WNYB	The Westchester County Business Journal (formerly Westchester Business Journal) from August 1985
WINC	Woman Inc. from September 1987
WKBJ	Wichita Business Journal from November 1987
WOB	London Business Monthly Magazine from March 1987
WOTT	Woman of the Times from October 1987
WPAPER	WorldPaper from January 1983
WPOST	The Washington Post from January 1977
WWEAR	Women's Wear Daily from January 1983

Table 3. Newspaper files available through MDC's NEXIS library as of spring 1989.

NEWSLETTER FILES

File Name	Description	Filename	Description
NWLTRS	Group file of all newsletters	HFRPTS	Heritage Foundation Reports from January 1987
ADDAY	Ad Day from January 1982	HOSPTL	Hospitals (formerly Hospitals, Journal of the American Hospital Association) from January 1983
ADMANF	Advanced Manufacturing Technology from January 1982	HTMTRL	High-Tech MATERIALS Alert from January 1984
AMSTAT	Update/The American States from January 1981	IINEWS	Institutional Investor Newsletter from January 1988
BIOPRO	Bioprocessing Technology from January 1982	INERGY	Inside Energy/with Federal Lands from January 1981
BIOTEC	McGraw-Hill's Biotechnology Newswatch from May 1981	INFERC	Inside F.E.R.C. from January 1981
BNABNK	BNA's Banking Report from January 1982	INNRC	Inside N.R.C. from January 1981
BNKEXP	Banking Expansion Reporter from January 1982	INRD	Inside R&D from January 1982
COALIN	Coal Week International from January 1981	LAN	Latin American Newsletters from April 1967
COALWK	Coal Week from January 1981	MDEAST	Middle East Executive Reports from September 1978
COMDLY	Communications Daily from January 1984	METLWK	Metals Week from January 1981
CONREV	Construction Review from May 1984	MLABOR	Monthly Labor Review from September 1984
DFAWKY	Defense & Foreign Affairs Weekly from January 1981	NSR	National Security Record from January 1987
DREXEC	Daily Report for Executives from January 1982	NUFUEL	NuclearFuel from January 1981
EASIAN	East Asian Executive Reports from September 1979	NUWEEK	Nucleonics Week from January 1981
EDUP	Education Update from Winter 1985	OCCOUT	Occupational Outlook Quarterly from June 1983
ELMKT	Electrical Marketing from May 1982	PETCHM	International Petrochemical Report from January 1983
ELUTL	Electric Utility Week from January 1981	POLICY	Policy Review from Winter 1986
EXECSP	The Executive Speaker from June 1980	PONEWS	Platt's Oilgram News from January 1981
EXPTLW	The Expert and the Law from December 1981	PPRICE	Platt's Oilgram Price Report from May 1982
FDA	FDA Consumer from January 1984	SECWK	Securities Week from January 1981
FEDWTC	FEDWATCH from March 1984	SRR	The Spang Robinson Report from January 1984
FNGAS	Foster Natural Gas Report from January 1981	SRVBUS	Survey of Current Business from February 1983
GENTEC	Genetic Technology News from January 1982	SSBLTN	Social Security Bulletin from January 1983
GRNMKT	Green Markets from May 1982	SYNFLS	Clean-Coal/Synfuels Letter from May 1982
		WLDFIN	World Financial Markets from January 1982

Table 4. Newsletters available through MDC's NEXIS library as of spring 1989.

Advertising and Marketing Intelligence (AMI)—abstracts from selected trade and professionals publications from January 1979 onward.

BIS/INFOMAT (BIS)—a newsfile from January 1986 onward.

FINIS—a financial industry information service from January 1982 onward.

PROFLE—a file that describes each individual NEXIS file including publication date range, frequency, availability of new material, and publisher's name and address.

Also, Mead Data Central is segmenting The NEXIS Service by grouping similar publications and information sources together within separate "libraries." The libraries are:

The Advertising and Public Relations Library

This library contains sources of information about advertising, public relations, and marketing communications. Each full-text publication can be searched as an individual file and in one or more group files such as ADNEWS, TRADE, GENL, or ALL. A user may select any combination of full-text, individual, or group files to be searched.

Government and Political News Library

This library contains relevant files including *The Almanac of American Politics, Billcast Legislative Forecasts for the 100th Congress, Billcast Archive—99th Congress, The Capital Source, Congressional Quarterly Weekly Report and Almanac, Department of State Bulletin, National Journal,* and *Presidential Documents.*

NAARS

National Automated Accounting Research System (NAARS) is produced in conjunction with the American Institute of Certified Public Accountants. The service provides accounting materials including information from the annual reports of certain public corporations. Also included in the service is the full text of selected authoritative accounting materials.

The LEXPAT Library

This library presents full-text patent information since 1975, including related patent research aids, the *U.S. Patent and Trademark Office Manual of Classification*, and the *Index to U.S. Patent Classification*, as well as other information not included in the original patent.

The Computers and Communications Library

This Library contains relevant full-text files from the NEXIS library including *Computerworld, Communica-*

WIRE SERVICE FILES

File Name	Description
WIRES	Group file of wire services*
AP	The Associated Press world, national, business, and sports wires from January 1977
ASAHI	Asahi News Service from August 1984
BUSRPT	The Reuter Business Report from May 1987
BWIRE	Business Wire from September 1983
CANRPT	The Reuter Canadian Financial Report from January 1987
CENEWS	Central News Agency from April 1984
ENS	Evans Economics, Electronic News Service
FEDNEW	Federal News Service from August 1988
FINRPT	The Reuter Financial Report from January 1987
INPRES	The Inter Press Service from April 1984
JIJI	Jiji Press Ticker Service from January 1980
JEN	Japan Economic Newswire from March 1980
LBYRPT	The Reuter Library Report from December 1981
MONRPT	The Reuter Money Report from January 1987
PRNEWS	PR Newswire from January 1980
REUTER	The Reuter News Reports from April 1979
SNS	States News Service from August 1984
SWNEWS	Southwest Newswire from February 1984
TASS	The Telegraph Agency of the Soviet Union from January 1987
UNS	Universal News Services from October 1986
UPI	United Press International world, national, business, and sports wires from September 1980
UPSTAT	United Press International State and Regional wires from November 1980 through December 1986
UPST88	United Press International State and Regional wires from January 1988
XINHUA	Xinhua (New China) News Agency from January 1977

**Excludes the UPSTAT file.*

Table 5. Wire services available through MDC's NEXIS library as of spring 1989.

tions Daily, *High Technology*, *High-Tech Materials Alert*, *InfoWorld*, *Inside R&D*, *Microwave Systems News and Communications Technology*, and the *Spang-Robinson Report*.

LEXIS Financial Information Service

The LEXIS Financial Information service offers one extensive company (COMPNY) library that contains more than 75 files of business and financial information. The library includes thousands of in-depth company and industry research reports from leading national and international banks and brokerage houses. Several different types of filings from the Securities and Exchange Commission (SEC) are also included such as full-text 10-Qs and 10Ks (without exhibits) and extracts of filings for more than 11,000 public companies whose securities are traded on the major exchanges as well as over the counter. Additionally, abstracts of proxy statements, registration statements, 13-Ds, 14-Ds, Form 4s, and many other filings are updated daily. The COMPNY library also offers business news abstracts from more than 400 information sources and current international financial news in full-text form. U.S. economic trends are monitored and forecast daily.

MEDIS

MEDIS, MDC's medical information service, contains medical and health care industry information covering diseases and treatments, medical products, and administration of health care and all related issues. MEDIS includes the following libraries:

CANCER—contains full-text oncology journals from GENMED and the Physician Data Query (PDQ). PDQ is a physician-to-physician dialog developed by the National Cancer Institute. This dialog contains terminology, summaries, treatment protocols, and state-of-the-art clinical data related specifically to cancer treatment. PDQ also has a physician directory and an organization directory.

MEDLINE—a bibliographic database produced by the National Library of Medicine. MEDLINE contains more than 5 billion characters. It includes citations and abstracts divided by years and subject group files. On MEDIS, MEDLINE is available in dynamic file selection across years.

For easier access, each library is then subdivided by topics into group files containing multiple information sources. Since each library covers different topics, the group file topics differ among the libraries. In addition to the topic group files, users may search an individual source or create a group file containing information sources of their own choosing.

MDC designed MEDIS with the end user in mind: instructions for searching are in plain English, and on-line tutorials are available.

OTHER SERVICES

ECLIPSE

MDC offers an electronic clipping service, called *ECLIPSE*. ECLIPSE automatically repeats a search daily, weekly, or monthly. It retrieves only the information on a specified topic that was added since the time of the last search.

Private Database Service

MDC's Private Database Service enables a customer to maintain a secure, private document retrieval system. MDC's customers include "Big 8" accounting firms, members of the *Fortune* 500, and top law firms.

Payback Service

Mead Data Central's Payback Service is intended for customers who need a weekly record of their LEXIS/NEXIS use. This facilitates timely billing of their own clients. The

Mead Data Central

▷ Payback Service provides use information for the previous eight full weeks in three forms: on-screen, with the option of printing; downloaded to a personal computer's hard disk or diskette; and magnetic tape.

Subsidiaries

Mead Data Central has five wholly owned subsidiaries:

Micromedex, Inc. is the world leader in providing information on CD-ROM to medical markets. Micromedex provides information on toxic substances (poison and treatments); evaluative information on more than 9,000 over-the-counter, foreign, and investigational drugs; and information for emergency room diagnosis and treatment.

Illinois Code Company provides manual searching, filing, and retrieval services for Uniform Commercial Code liens, intercorporation records, and tax liens filed in any U.S. state or county.

Dataline, Inc., a leading Canadian financial information services company, provides realtime Canadian and U.S. stock market quotations and other financial information to the investment, brokerage, and banking industries.

The Michie Company, a legal publisher of regulatory materials, treatises, state statutes, and other legal reference books. It has been a leader in its industry since 1897 and has headquarters in Charlottesville, Virginia.

Jurisoft, Inc., a leading publisher of legal software including CiteRite II, which checks the format of legal citations in word processing documents; FullAuthority, which creates legal citation tables or tables of authority; and CompareRite, which highlights the differences between two drafts of a document and eliminates hundreds of hours of proofreading.

FUTURE PLANS

MDC continues to develop new products and services to meet the needs of its customers, and these will be announced as soon as they are available. ☐

National Library of Medicine (NLM)

Now considered the world's largest medical research library, the National Library of Medicine (NLM) was established in 1836 as the Library of the Army Surgeon General's Office. The NLM provides researchers with on-line access to more than 10 million references to journal articles, records to more than 600,000 books, and citations to 14,000 audiovisual items through its MEDLARS system and the more than 20 databases that are derived from it.

The NLM's databases are accessible directly through the NLM or through commercial on-line vendors. They include information on cancer research, population and reproduction, bioethics, health planning, audiovisual materials, and other specialized areas of health and disease. Part of the National Institutes of Health (NIH), the NLM offers its services through affiliated libraries and centers.

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COMPANY INFORMATION

National Library of Medicine
8600 Rockville Pike
Bethesda, Maryland 20894 (301) 496-6308

UPDATE: *The National Library of Medicine (NLM) continues to expand its holdings and increase the size of its databases. The NLM has also added a significant new database,* AIDSLINE, *which cites articles on the clinical and research aspects of AIDS. In addition, the NLM introduced a new version (4.0) of its Grateful Med software package. Version 4.0 includes such enhancements as a new, easier-to-use setup menu; form screen access to the current month of* MEDLINE; *and access to its new* AIDSLINE *file.*

Company Background

The National Library of Medicine (NLM) is widely considered the "library of record" for medical and related science literature. Its holdings include more than 3.9 million books, journals, technical reports, manuscripts, microfilms, and pictorial materials. These materials cover more than 40 biomedical areas including chemistry, psychology, botany, zoology, and veterinary medicine.

The NLM represents a fascinating blend of the old and new. While it has one of the finest historical collections of medical texts and manuscripts (dating back to the 11th Century), it has also pioneered the use of computers for handling library tasks. Its ground-breaking Medical Literature Analysis and Retrieval System (MEDLARS) became operational in 1964.

The NLM traces its origins back to 1836, when the Library of the Army Surgeon General's Office was established. In 1922, this institution became the Army Medical Library, and in 1952, reflecting further changes in its organization and sponsorship, the Library was renamed the Armed Forces Medical Library. Finally, in 1956, as a provision of the National Library of Medicine Act (sponsored by Senators Lister Hill and John F. Kennedy), the Library was given its present name.

Although founded in 1836, it was not until the tenure of John Shaw Billings, director of the Library from 1865 to 1895, that the NLM developed into the finest institution of its kind. Under Billings' direction, the Library's collection grew from 1,800 volumes to 117,000 books and 192,000 pamphlets.

Billings, a former army surgeon, was also responsible for bringing libraries into the "computer age." In addition to his duties at the Library of the Surgeon General's Office, Billings was in charge of vital statistics for the 1880 census. In a meeting with Herman Hollerith, a Census Office engineer, Billings discussed the need for a machine to do the mechanical work of tabulating the census and population statistics. Billings suggested that statistical data might be recorded on cards by punching small holes in them, and that these cards might be sorted mechanically. Based on the principles Billings suggested, Hollerith developed an electric tabulator. This rudimentary "computer" was used with great success in the 1890 census. (Hollerith subsequently improved his machine and eventually sold his patents to what is now IBM.)

With the proliferation of journal literature following World War II, manual systems were no longer adequate for retrieving bibliographic citations or compiling the Library's

▷

NLM building (right) dedicated 1962; Lister Hill Center (left) dedicated 1980.

publications (such as *Index Medicus*). Consequently, in the late 1950s, the NLM explored the use of modern computers to create a system that would allow the Library to both keep up with its indexing chores and quickly retrieve bibliographic information. The resulting system—dubbed MEDLARS, for Medical Literature Analysis and Retrieval System—began operation in January 1964. MEDLARS enabled users to search the Library's collection much more quickly and comprehensively than before, as well as providing the source data for more than two dozen publications, including *Index to Dental Literature* and *International Nursing Index.*

Today, as the national resource for all U.S. health science libraries, the NLM collects materials exhaustively in all major areas of the health sciences and, to a lesser degree, in such areas as chemistry, physics, and zoology. Aside from its collection of more than 3.9 million books, journals, technical reports, manuscripts, etc., the Library boasts one of the world's finest collections of rare medical texts, manuscripts, and incunabula (books printed prior to 1501). The NLM also offers more than 20 health sciences-related databases, such as *MEDLINE*, *CANCERLIT*, *PDQ*, and *POPLINE.*

Competitive Position

People are now taking more responsibility for their own health due to the rising cost of health care and greater awareness of health issues. This trend bodes well for the National Library of Medicine, which finds itself sitting atop one of the world's premier repositories of biomedical information. Formerly a resource tapped almost exclusively by medical librarians and other health professionals, the NLM has moved beyond that base to reach end users themselves—doctors, nurses, students, and the general public. Its success there is due largely to its Grateful Med front-end software package (see Figure 1), which permits inexpensive menu-driven access to its databases, including *MEDLINE.* The NLM recently introduced a new version of Grateful Med, and sees the software package as a key to the wider dissemination of its on-line information.

Many other vendors make the NLM's data available (both in on-line and CD-ROM form), but they all charge more than the NLM. In many ways, the NLM's closest competitor is PaperChase, which also provides a simplified access front-end to *MEDLINE.* PaperChase is reasonably priced, and it charges nothing for its widely circulated software. PaperChase is available either on a direct dial-up basis, or as a separate feature on other on-line services such as CompuServe.

Even if the NLM did have serious competition, it would not have to worry about possible impact on bottom-line profits. As a unit of the National Institute of Health (NIH), its funds are appropriated. But the NLM is still interested in broadening its market base, and like any library, disseminating its information as widely as possible. Also, the greater the use of its resources, the more easily it can justify increased appropriations.

RESOURCES AND FACILITIES

The NLM occupies two buildings on the NIH campus. The National Library of Medicine building contains the collection, reading rooms, and public services. The adjacent Lister Hill Center Building contains the NLM's computer facility, an auditorium, research and development laboratories, the Toxicology Information Program, and the Extramural Programs (grants). The two buildings total some 432,000 square feet. The Library has a staff of 505 and an annual budget of $78 million.

Processing Center

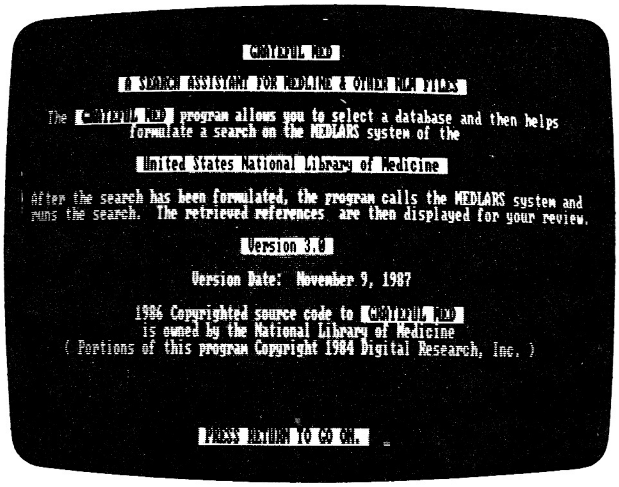
The NLM's computer facility contains an IBM 3084 mainframe. The on-line databases are stored on more than 225 billion bytes of on-line disk storage.

Systems Software

Operating System: The IBM 3084 mainframe uses the ELHILL Retrieval system under the MVSXA Operating System. ELHILL was developed specifically for the NLM in the mid-1960s.

Customer Support Services

The Library's extensive collections and information services can be used by health professionals and health science students. Books and journals can be consulted in the reading rooms, or they can be requested through interlibrary loan. Medical audiovisual materials can be viewed in the



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                         GRATEFUL MED

          A SEARCH ASSISTANT FOR MEDLINE & OTHER NLM FILES

 The GRATEFUL MED program allows you to select a database and then helps
            formulate a search on the MEDLARS system of the

              United States National Library of Medicine

After the search has been formulated, the program calls the MEDLARS system and
runs the search.  The retrieved references  are then displayed for your review.

                          Version 3.0

                  Version Date:  November 9, 1987

              1986 Copyrighted source code to GRATEFUL MED
              is owned by the National Library of Medicine
    ( Portions of this program Copyright 1984 Digital Research, Inc. )



                    PRESS RETURN TO GO ON. _
```

Figure 1. The "welcome screen" from Grateful Med, the NLM's front-end software package. Grateful Med simplifies access to MEDLINE and other NLM databases.

Library's Learning Resource Center and likewise can be borrowed on interlibrary loan. There is a fee for all interlibrary loan transactions.

Lending and other services are provided through a Regional Medical Library Network consisting of 4,000 "basic unit" libraries (mostly at hospitals); 125 Resource Libraries (at medical schools); seven Regional Medical Libraries (covering all geographic regions of the U.S.); and the NLM itself, as a national resource for the entire network. Approximately 2 million interlibrary loan requests are filled each year within this network.

The NLM's databases can be accessed 24 hours a day, 7 days a week.

PROCESSING SERVICES

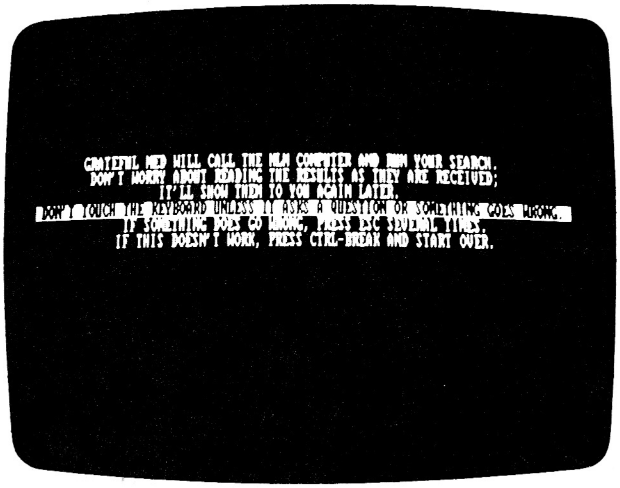
Pricing Information

The NLM charges user fees to recover the full costs of providing access to the system. For U.S. users, the cost of accessing *MEDLINE* and the majority of the MEDLARS databases is approximately $20 per hour; accessing the NLM's toxicology databases is somewhat more expensive. For additional information, contact the NLM directly.

INDUSTRY-SPECIFIC SERVICES

MEDLARS

The NLM established its computer-based Medical Literature Analysis and Retrieval System (MEDLARS) to achieve rapid bibliographic access to its vast store of biomedical information. Historically, MEDLARS was a pioneering effort to use the emerging computer technology of the 1960s for the production of bibliographic publications and for conducting individualized literature searches for health professionals.



```
GRATEFUL MED WILL CALL THE NLM COMPUTER AND RUN YOUR SEARCH.
DON'T WORRY ABOUT READING THE RESULTS AS THEY ARE RECEIVED;
IT'LL SHOW THEM TO YOU AGAIN LATER.
DON'T TOUCH THE KEYBOARD UNLESS IT ASKS A QUESTION OR SOMETHING GOES WRONG.
IF SOMETHING DOES GO WRONG, PRESS ESC SEVERAL TIMES.
IF THIS DOESN'T WORK, PRESS CTRL-BREAK AND START OVER.
```

Figure 2. After the user inputs a search request, Grateful Med takes over completely. It logs on, enters the search, transfers the results to disk, and logs off from the system. Notice that it instructs the user not to touch the keyboard unless there is a problem.

MEDLARS is still used for preparing and photocomposing bibliographic publications. *Index Medicus*, a monthly subject/author guide to articles in nearly 3,000 journals, is the best known of these, but dozens of other specialized medical bibliographies are produced as well.

MICROCOMPUTER SOFTWARE/ SERVICES

MEDLINE Subsets

The NLM offers subsets of *MEDLINE* for use on personal and institutional computers. The Library can provide requested citations from *MEDLINE* and its backfiles on magnetic tape for local storage and reuse. Currently, more than 10 million citations from biomedical journals from 1966 to the present are available. Subsets can be defined by subject, time period, language, journal title, and other delimiting factors.

Depending on the needs of the requestor, each record can provide the citation only; citation with indexing terms; citation with abstract; etc. Requestors can lease a onetime subset or receive monthly or quarterly updates as the NLM adds new citations to *MEDLINE*. The charge for the service varies with the size of the subset and the distribution medium, whether updates are chosen, and the number of people who will use the subset in an institutional setting.

Various subsets of *MEDLINE* are also available on CD-ROM disks from commercial vendors. They are the result of cooperative agreements between the NLM and private firms. A list of companies offering *MEDLINE* on CD-ROM is available from the NLM Public Information Office.

Grateful Med

Introduced in early 1986 and enhanced through three subsequent versions, Grateful Med is a front-end software package designed to simplify the procedure for accessing *MEDLINE*, its backfiles, *CATLINE*, *AVLINE*, *CANCERLIT*, *CHEMLINE*, *DIRLINE*, *HEALTH*, and *TOXLINE*. After the searcher types in a query, Grateful Med takes over—it calls up the Library's computers, logs on, enters the queries as specified by the user, retrieves references and abstracts, and transfers them to the diskette (see Figure 2). The package comes on two diskettes with instructions and an application for a user code. Users receive a monthly bill for their use of the system—approximately $20 per hour for time connected to the computers. This works out to $1 to $4 for most searches. Grateful Med is available through the National Technical Information Service (NTIS). A demo/

National Library of Medicine (NLM)

The computer room of the National Library of Medicine. The Library's well-known Medical Literature Analysis and Retrieval System (MEDLARS) is operated on these computers, providing a variety of bibliographic services via publications and on-line access.

tutorial disk is available without charge. For additional information, contact the NLM or NTIS directly.

NETWORKING SERVICES

The NLM's databases are accessible through the Tymnet, Telenet, CompuServe, and Infonet telecommunications networks.

ON-LINE DATABASES

MEDLARS search services are available on-line to researchers at biomedical libraries and other institutions throughout the world.

Over the years of its evolution, MEDLARS has come to represent a family of databases, of which the *MEDLINE* database is the best known. Essentially an on-line version of *Index Medicus, MEDLINE* enables organizations with computer terminals to query the NLM's store of journal article references on specific topics.

All of the MEDLARS databases are available for on-line searching from terminals at more than 13,000 institutions in the U.S. An additional 10,000 individuals have direct access, usually through Grateful Med. These institutions performed 4 million searches in 1988.

Besides *MEDLINE*, which became operational in 1971, the NLM now offers some 20 other databases, including the following:

CATLINE (Catalog On-line)—approximately 650,000 references to books and serials cataloged at NLM.

SERLINE (Serials On-line)—bibliographic information for about 70,000 serial titles, including all journals that are on order or cataloged for the NLM collection.

AVLINE (Audiovisuals On-line)—citations to more than 18,000 audiovisual teaching packages covering subject areas in the health sciences and cataloged by NLM since 1975.

HISTLINE (History of Medicine On-line)—90,000 citations to monographs, journal articles, symposia, congresses, and similar composite publications, as published annually in the *Bibliography of the History of Medicine.*

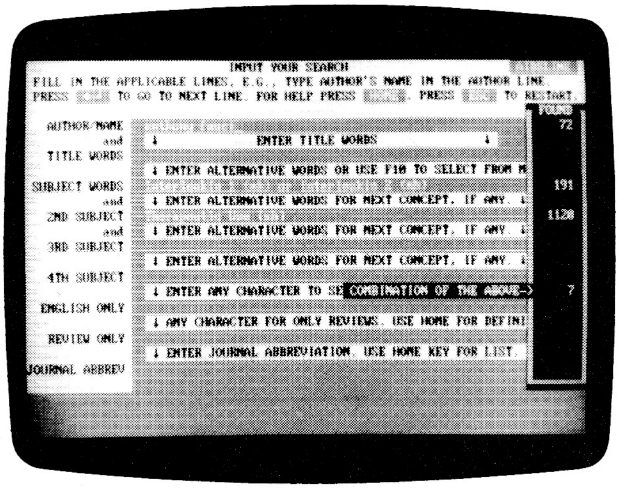
TOXLINE (Toxicology Information On-line)—bibliographic information covering pharmacological, biochemical, physiological, environmental, and toxicological effects of drugs and other chemicals. *TOXLINE* contains more than 1.4 million references, almost all with abstracts and/or indexing terms and CAS Registry Numbers. TOXLIT contains an additional 1.3 million references from sources with royalty charges.

HSDB (Hazardous Substances Data Bank)—approximately 4,200 comprehensive, peer-reviewed chemical records. Compounds selected for *HSDB* include high-volume production or exposure chemicals and other drugs and pesticides with actual or potential toxicity.

CHEMLINE (Chemical Dictionary On-line)—an on-line chemical dictionary with more than 842,000 records. *CHEMLINE* contains chemical names, synonyms, CAS Registry Numbers, molecular formulas, NLM file locators, and limited ring information.

Health Planning and Administration—more than 450,000 references to literature on health planning, organization, financing, management, work force, and related subjects. The database is produced cooperatively by the NLM and the American Hospital Association.

CANCERLIT (Cancer Literature)—more than 644,000 references dealing with various aspects of cancer. It is sponsored by the NIH's National Cancer Institute.



```
                         INPUT YOUR SEARCH
FILL IN THE APPLICABLE LINES, E.G., TYPE AUTHOR'S NAME IN THE AUTHOR LINE.
PRESS       TO GO TO NEXT LINE. FOR HELP PRESS      . PRESS      TO RESTART.

AUTHOR/NAME                                                               72
        and   ↓             ENTER TITLE WORDS              ↓
TITLE WORDS
              ↓ ENTER ALTERNATIVE WORDS OR USE F10 TO SELECT FROM M
SUBJECT WORDS                                                            191
        and   ↓ ENTER ALTERNATIVE WORDS FOR NEXT CONCEPT, IF ANY. ↓
2ND SUBJECT                                                             1120
        and   ↓ ENTER ALTERNATIVE WORDS FOR NEXT CONCEPT, IF ANY. ↓
3RD SUBJECT
              ↓ ENTER ALTERNATIVE WORDS FOR NEXT CONCEPT, IF ANY. ↓
4TH SUBJECT
              ↓ ENTER ANY CHARACTER TO SE COMBINATION OF THE ABOVE->       7
ENGLISH ONLY
              ↓ ANY CHARACTER FOR ONLY REVIEWS. USE HOME FOR DEFINI
REVIEW ONLY
              ↓ ENTER JOURNAL ABBREVIATION. USE HOME KEY FOR LIST.
JOURNAL ABBREV
```

Figure 3. Grateful Med's input screen, tailored to the database, allows the searcher to search by several criteria.

National Library of Medicine (NLM)

CLINPROT (Clinical Cancer Protocols)—summaries of clinical investigations of new anticancer agents and treatment modalities. Produced by the National Cancer Institute, the database is designed primarily as a reference tool to clinical oncologists, but is also useful to other clinicians interested in new cancer treatment methods.

PDQ—a user-friendly system that contains cancer treatment information, a directory of physicians and organizations that provide cancer care, and a file of ongoing treatment protocols.

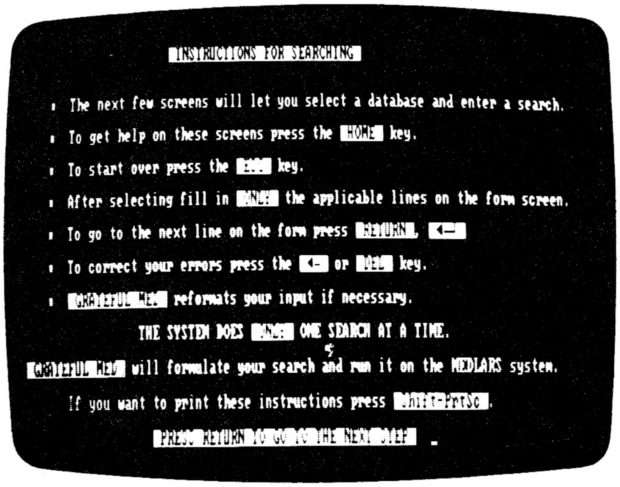
DIRLINE (Directory of Information Sources On-line)—a directory of information resources developed and maintained by the National Referral Center of the Library of Congress. *DIRLINE* lists 15,000 sources of information, such as technical libraries, professional societies, and federal and state agencies.

SDILINE (Selective Dissemination of Information Online)—all citations to the forthcoming printed edition of the monthly *Index Medicus.*

AIDSLINE—citations to 15,000 articles, 1980 to present, on the clinical and research aspects of AIDS.

RTECS (Registry of Toxic Effects of Chemical Substances)—basic acute and toxicology data for more than 97,000 potentially toxic chemicals. An on-line interactive version of the National Institute of Occupational Safety and Health (NIOSH) publication, *Registry of Toxic Effects of Chemical Substances.*

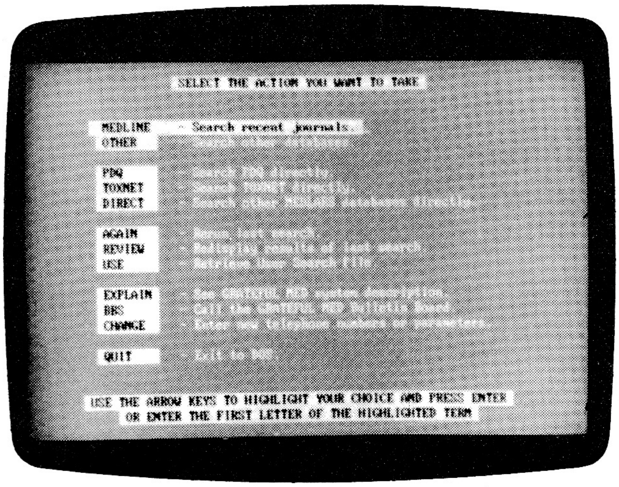
BIOETHICSLINE—citations to documents that discuss ethical questions arising in health care or biomedical research. A comprehensive, cross-disciplinary collection of references to print and nonprint materials on bioethical topics, *BIOETHICSLINE* contains more than 27,000 citations from 1973 to date.



```
INSTRUCTIONS FOR SEARCHING

 ▪ The next few screens will let you select a database and enter a search.
 ▪ To get help on these screens press the HOME key.
 ▪ To start over press the [illegible] key.
 ▪ After selecting fill in ONLY the applicable lines on the form screen.
 ▪ To go to the next line on the form press RETURN, <-
 ▪ To correct your errors press the <- or DEL key.
 ▪ GRATEFUL MED reformats your input if necessary.
           THE SYSTEM DOES ONLY ONE SEARCH AT A TIME.
GRATEFUL MED will formulate your search and run it on the MEDLARS system.
    If you want to print these instructions press Shift-PrtSc.
             PRESS RETURN TO GO TO THE NEXT STEP  _
```

Figure 4. Grateful Med's action screen guides the new user step-by-step through the use of the package.



```
            SELECT THE ACTION YOU WANT TO TAKE

   MEDLINE   - Search recent journals.
   OTHER     - [illegible]

   PDQ       - [illegible]
   TOXNET    - [illegible]
   DIRECT    - [illegible]

   AGAIN     - [illegible]
   REVIEW    - [illegible]
   USE       - [illegible]

   EXPLAIN   - [illegible]
   BBS       - [illegible]
   CHANGE    - [illegible]

   QUIT      - Exit to DOS

 USE THE ARROW KEYS TO HIGHLIGHT YOUR CHOICE AND PRESS ENTER
       OR ENTER THE FIRST LETTER OF THE HIGHLIGHTED TERM
```

Figure 5. From this screen the Grateful Med user has several options: to search MEDLINE or another NLM database; search the system via native (unassisted) mode; reconfigure the software; read a description of the program; or review the results of the last search run.

POPLINE (Population Information On-line)—167,000 bibliographic citations to literature on population and family planning. The database is produced in cooperation with the Johns Hopkins University and Princeton University.

OTHER SERVICES

National Library of Medicine/National Institutes of Health Information Service—an electronic bulletin board for health professionals aimed at speeding the transfer of new knowledge "from the laboratory to the bedside." A joint venture of the NLM and NIH, in cooperation with the American Medical Association (AMA), the service is menu driven and designed to be easy to use.

There are a number of services available on the AMA's AMA/NET network in addition to the bulletin boards: bibliographic retrieval, drug information, continuing medical education, and Associated Press health-related items, among others. Initial access is free to AMA members, $160 to nonmembers. The on-line fee is $0.50 per minute.

The basic menu contains the following six components:

- News from the NLM
- Computerized Searches from the NLM
- Send a MED/MAIL Message to the NLM Director
- NIH Meetings of Clinical Interest
- NIH Consensus Development Conferences
- Current Clinical Studies at NIH

In addition to the electronic bulletin board, AMA/NET provides gateway access to *MEDLINE* via Grateful Med. Both services are made available in cooperation with the AMA and Softsearch, Inc. ☐

NewsNet, Inc.

In this report:

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Competitive Position .... -103

Resources and Facilities .... -103

Pricing .... -104

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Synopsis

Editor's Note

NewsNet, founded in 1982, specializes in providing on-line access to newsletters. The company now provides access to more than 400 newsletters, five UPI newswires, *Reuter News Reports*, *Associated Press DataStream Business News*, *Business Wire, JiJi Press Ticker Service*, *PR Newswire* and *Xinhua English Language News Service*. Gateways to *The Official Airline Guide Electronic Edition (OAG)*, *TRW Business Profiles* (which provide credit and business information on nearly 10 million companies), and several other external databases are also available.

NewsFlash, NewsNet's current awareness service, automatically alerts users when articles new to the NewsNet system match their interest profiles.

Report Highlights

This report covers the services offered by NewsNet, Inc., the world's leading vendor of on-line newsletters. NewsNet provides access to more than 400 newsletters, spanning more than 40 industries. It also provides access to several leading newswires and other services geared to businesspeople. NewsNet is particularly useful for market researchers, journalists, and other analysts who need up-to-the-minute information, since many of its sources appear in on-line form before they are available as hard copy publications. In addition, many of NewsNet's newsletters are only available electronically.

Vendor

NewsNet, Inc.
945 Haverford Road
Bryn Mawr, PA 19010
(215) 527-8030

Analysis

NewsNet, Inc. has built a comfortable niche for itself as a provider of on-line newsletters and other timely information sources. Founded in April 1982 by Independent Publications, Inc. (a century-old company with deep roots in the publishing industry), NewsNet has found a ready market as the kind of inside, expert information newsletters provide is not available from other sources. NewsNet has also succeeded in making its information easily accessible. This combination of a well thought-out service and a unique focus have earned NewsNet a reputation as one of the on-line industry's most respected companies.

Figure 1.
NewsNet's Welcome Screen

```
*****************
* NEWSNET * for the Business Information Edge
*****************

Copyright NewsNet 1982, 1990. Copying or redistribution by any means
strictly prohibited without prior written permission. For details, refer to
'Terms and Conditions of NewsNet Use' and the NewsNet Reference
Guide, or enter HELP TERMS at the main command prompt.

***SUPERCONDUCTIVITY IS STILL HOT—find out why with SUPER-
CONDUCTOR WEEK (EC75), the authoritative source from Atlantic Infor-
mation Services. Special emphasis is on developments and applications
of high temperature superconductivity (high Tc) and on superconductor
news from Japan. SCAN EC75 today for the most recent updates. For
more information, type HELP EC75 at any NewsNet prompt.

***ONLY THE NAME HAS CHANGED: C4I REPORT (DE11) still provides
you with the latest news and developments on command, control, com-
munications, computers, and intelligence programs in the defense indus-
try. This publication was formerly called C3I REPORT. Details? Enter
HELP DE11. SCAN DE11 now for the latest.


New Services on NewsNet:

   EC21          Edge: Work-Group Computing Report
   FI53          Dealing With Technology
   EC19          Item Processing Report

For details on all new services, READ PB99#.

At any time, enter ? for assistance or HELP for detailed instructions.

Enter command or <RETURN>
→
```

NewsNet's welcome screen, updated regularly, advertises NewsNet files covering timely topics and newly added databases.

NewsNet is continually adding new sources and enhancing its software to increase the utility of its service. In 1990, the company also greatly enhanced its NewsFlash electronic clipping service that automatically scans newsletters and wire service stories as they pulse into the NewsNet system, for items matching a user's area of interest.

NewsNet is privately held and does not release subscriber count, revenue, or usage details. It does report that its subscriber count (estimated to be upward of 15,000) is growing, as is usage.

Company Background

NewsNet's data bank of on-line newsletters has grown from an initial offering of 14 to more than 400 today. Coverage spans more than 40 industries including publishing, telecommunications, microcomputers, taxes, energy, investment, environment, government, business, and defense.

NewsNet also provides gateways to external databases including *The Official Airline Guide Electronic Edition (OAG)* and *TRW Business Profiles* and many newswires. NewsNet's on-line system enables users to read, scan, and search each database. SCAN commands provide the headlines of stories in designated subject areas. Searches can accommodate Boolean strings, multiple terms, proximity searching, and exclusions.

NewsNet also offers an electronic news clipping service, *NewsFlash*, which enables users to designate an interest profile of virtually unlimited numbers of keywords or phrases. (Users can monitor their own names, their companies, competitors, product areas, geographic regions, etc.) A list of headlines, together with the keyword that generated the "hit," is provided each time the user signs on. With NewsFlash, the subscriber can monitor and read only those articles of interest.

NewsNet also offers an electronic mail service, which enables users to communicate problems, questions, or requests for more information to NewsNet or to a NewsNet information provider. Users can also order the hard copy version of the newsletters via the electronic mail service.

NewsNet is accessible 24 hours a day through any personal computer, terminal, or communicating word processor at 300, 1200, or 2400 baud via SprintNet, Tymnet, or ITT or directly through NewsNet.

What follows are some significant changes NewsNet made to its database during the past year:

- Added line and word counts to its headline displays.
- Enhanced its NewsFlash electronic clipping service, allowing users to monitor an almost unlimited number of phrases. It also now offers complete search logic options.
- New system prompts were added to improve readability and functionality.
- Made its newswires searchable.
- Added *Commerce Business Daily* and more than 80 newsletters to its menu of on-line services.

Competitive Position

NewsNet remains the only on-line vendor concentrating on providing access to newsletters. Its main competition comes from Predicasts, which offers a single database file containing access to the back issues of well over 100 newsletters. The file is widely available through DIALOG (which has more than 100,000 users) and is reportedly very popular. Additional competition comes from Mead Data Central, whose NEXIS full-text information service also offers access to many newsletters.

NewsNet has an advantage over these competitors in that it has been specializing in newsletters longer and has built relationships with many of the information providers that produce newsletters. Because of its place in the industry, when searchers think of on-line newsletters they are likely to think of NewsNet first rather than, say, Predicasts or Mead Data Central.

Also, NewsNet claims that a selling point of its service is the fact that many of its "dailies" are available electronically before they are available in hard copy form. NewsNet is repositioning itself as more than merely a vendor of databases, but rather as a *current awareness service* specializing it providing access to timely information. In other words, NewsNet offers up-to-the-minute information—not just newsletters. Its enhancement of its NewsFlash service is in keeping with this new marketing strategy. It has also increased the utility of its realtime newswires by making them searchable. Finally, as far as its newsletters are concerned, NewsNet maintains that it is the only on-line source for many of those that it vends.

Resources and Facilities

Processing Centers

NewsNet's processing facilities are located in Bryn Mawr, PA.

Customer Support Services

Four customer service representatives are available full-time; six representatives are present during peak periods.

Sales and Marketing Services

NewsNet's sales office is located at its Bryn Mawr, PA headquarters. Table 1 lists NewsNet's international sales offices.

Table 1. NewsNet's International Sales

Nation	Representative
Japan	Kokusai Information Service Co., Ltd. 9th Floor Shibuya Sumitomo Shintaku Building 22-3 Jinnan 1-Chome, Shibuya-Ku Tokyo 150, Japan Telephone: 03-463-7181 Telex: 24203526 KOKIMF J
Israel	Elnet Ltd., A unit of Aurec Ltd. P.O.B. 24049 Tel Aviv 61240, Israel Telephone: 494444 or 494455
W. Germany Austria	High Tech Verlag Gmbh Leopold Str. 70 D-8000 Muenchen 40 Federal Republic of Germany Telephone: (89) 39 10 11
Singapore Hong Kong Malaysia Indonesia Thailand Philippines	Integrated Information Pte, Ltd. 456 Alexandra Road, #18-00 NOL Building Singapore 0511 Telephone (065) 278-9811 Telex: RS37071
United Kingdom (Scotland, England, Wales) Ireland	Thompson, Henry Ltd. London Road Sunningdale, Berks. SL5 OEP Telephone: (099) 291072
Denmark Finland Iceland Norway Sweden	Databasecenteret/DanaData A/S Vestergade #8 8000 Aarhus Denmark Telephone: 45652274

Processing Services

Pricing

NewsNet charges a subscription fee, payable annually ($120), semiannually ($75), or monthly ($15). The minimum subscription period is 30 days. The basic connect charge at 300 and 1200 baud is $60 per hour; $90 at 2400 baud. These rates are subject to premiums for higher access speeds and publisher READ surcharges.

The publishers also designate a user as being a *validated* or *nonvalidated* subscriber. Validated subscribers are those who also subscribe to the print version of the publisher's newsletter. Read rates are lower for the validated subscribers in most cases. Rates for the majority of the newsletters (for validated and nonvalidated subscribers) are given in the On-line Databases (OL40) section of this Directory.

NewsNet also makes available introductory offers for new subscribers that include free on-line time. Multiple account and academic discounts are available as well.

Table 2 summarizes NewsNet's pricing.

Application-Specific Services

Electronic Mail

NewsNet offers an electronic mail service that enables its users to easily correspond with the information providers that furnish NewsNet's newsletters and other services. Users can also correspond this way with NewsNet. Messages may pertain to subscription details, service questions or problems, or information requests of all types.

Table 2. NewsNet's Pricing Schedule

Basic Service	Prices ($)
300 to 1200 baud	60.00/hour
2400 baud	90.00/hour
Miscellaneous Charges	
NewsFlash Hits (delivery charge)	0.50/hit
TRW Reports	32.00/report

Industry-Specific Services

The NewsNet database contains information associated with a variety of subject areas, including the following:

- Advertising and Marketing
- Aerospace and Aviation
- Automotive
- Biotechnology
- Building and Construction
- Chemical
- Corporate Communications
- Defense
- Education
- Electronics and Computers
- Energy
- Entertainment and Leisure
- Environment
- Food and Beverage
- Finance and Accounting
- General Business
- Government and Regulatory
- Health and Hospitals
- Insurance
- International
- Investment
- Investext
- Law
- Management
- Metals and Mining
- Politics
- Public Relations
- Publishing and Broadcasting
- Real Estate
- Research and Development
- Social Sciences
- Taxation
- Telecommunications
- Tobacco
- Transport and Shipping
- Travel and Tourism

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Datapro Research Group. Delran NJ 08075 USA

Table 3. NewsNet's Databases and Online Services

Advertising and Marketing (AD)	
AD10	Affluent Markets Alert
AD13	American Marketplace
AD14	Boomer Report, The
AD06	Marketing Research Review
AD11	Minority Markets Alert
AD08	PR Hi-Tech Alert
AD09	Research Alert
AD07	Video Marketing Newsletter
AD12	Youth Markets Alert
Aerospace and Aviation (AE)	
AE17	Air Safety Week Accident/Incident Log
AE16	Air Safety Week Newsletter
AE18	Air Safety Week Regulatory Log
AE14	Avionics Report
AE12	Helicopter News
AE06	Japanese Aviation News: Wing
AE01	Satellite Week
AE11	Space Business News
AE04	Space Calendar
AE05	Space Commerce Bulletin
AE07	Space Daily
AE13	Space Station News
AE15	Speednews
Automotive (AU)	
AU05	Comline Japan Daily: Transportation
AU06	SIS Automotive Industry Abstracts
AU07	Korea Automotive Review
Associated Press (AP)	
AP01W	AP DataStream Business News Wire
Biotechnology (BT)	
BT03	Applied Genetics News
BT01	Bioprocessing Technology
BT06	Biotech Business
BT07	Comline Japan Daily: Biotechnology
BT02	Genetic Technology News
BT04	High Tech Separations News
BT05	Membrane & Separation Technology News
Business Wire (BW)	
BW01W	Business Wire
Catholic News (CN)	
CN01	Catholic News Service
CN02	Catholic Trends
CN03	Origins: Catholic Documentary Service
Chemical (CH)	
CH15	Chemical Monitor, The
CH16	Comline Japan Daily: Chemicals
CH10	Hazardous Waste News
CH11	State Regulation Report: Toxics
CH12	Toxic Materials News
CH14	Toxic Materials Transport
Commerce Business Daily (CB)	
CB01T	Procurements—Services
CB02T	Procurements—Supplies
CB03T	Contract Awards—Services
CB04T	Contract Awards—Supplies
CB05	Special Notices
CB06	Foreign Government Standards
Defense (DE)	
DE03	Advanced Military Computing
DE11	C3I Report
DE01	Defense Daily
DE08	Defense Industry Report
DE17	Defense Marketing International
DE07	Defense R&D Update
DE20	Defense Technology Business
DE16	Defense Week
DE15	For Your Eyes Only
DE06	Military Fiber Optics News
DE14	Military Robotics
DE19E	Military Robotics 1989 Sourcebook
DE04	Military Space
DE18	Navy News & Undersea Technology
DE21	Periscope—Daily Defense News Capsules
DE09	SDI Intelligence Report
DE05	SDI Monitor
DE02	Soviet Aerospace & Technology
DE13	Strategic Defense
Education (ED)	
ED09	Black Issues In Higher Education
ED08	Education Daily
ED06	Education of the Handicapped
ED07	Report on Education Research
ED10	Report on Literacy Programs
ED03	Student Aid News
ED02	School Law News
ED04	Vocational Training News
Electronics and Computers (EC)	
EC93	Audio Week
EC22	Business Computer, The
EC60	Career*Exchange—The Computer Field
EC67	CD Computing News
EC65	CD Data Report
EC71	CD-ROM Databases
EC83	Comline Japan Daily: Computers
EC84	Comline Japan Daily: Electronics
EC27	Computer Book Review
EC74	Computer Protocols
EC79	Computer Workstations
EC72	Computergram International
EC01	Consumer Electronics
EC82	Computerized Processes
EC61	HR/PC Online
EC55	IDB Online—The Computing Industry Daily
EC05	Imaging Update
EC39	Japan Computer Industry Scan
EC92	Japan Consumer Electronics Scan
EC28	Japan High Tech Review
EC43	Japan Semiconductor Scan
EC99	LAN Product News
EC87	Mainframe Computing
EC64	Microcomputer Resources
EC59	Microcomputers in Education
EC97	Modem Users News
EC03	Monosson Report on DEC and IBM, The
EC58E	NASA Software Directory
EC86	Netline
EC95	Networks Update
EC89	Newsbytes News Network
EC76	OPEN: OSI Product and Equipment News
EC51	Optical Information Systems Update
EC48	Outlook on IBM
EC94	PC Business Products
EC80	Productivity Software
EC45	Report on IBM, The
EC49	Robot News
EC78	SAA Age—An Inside Look at IBM
EC77	SNA Communications Report
EC35	Semiconductor Industry & Business Survey
EC20	Seybold Outlook: Professional Computing
EC75	Superconductor Week
EC04	Systems Integration Business & Marketing
EC73	Technical Computing
EC70	Videodisc Monitor, The
Energy (EY)	
EY57	Energy Daily, The
EY50	Energy Report, The
EY60	Enhanced Energy Recovery News
EY53	Hydrowire
EY58	Japan Energy Scan
EY56	Offshore Gas Report
EY54	Purpa Lines
EY55	U.S. Oil Week
EY12	Utility Reporter—Fuels, Energy & Power
Entertainment and Leisure (EL)	
EL05	Fearless Taster, The
EL09	Hollywood Hotline
EL01	Video Week
Environment (EV)	
EV10	Air/Water Pollution Report
EV23	California Planning & Development Report
EV25	Environment Week
EV14	Environmental Compliance Update
EV18	Ground Water Monitor
EV21	Hazardous Materials Intelligence Report
EV30	Medical Waste News
EV01	Multinational Environment Outlook
EV03	Nuclear Waste News
EV20	Solid Waste Report
EV26	Waste Treatment Technology News
Finance and Accounting (FI)	
FI10	American Banker Full Text
FI33	Asset Sales Report
FI08	Bond Buyer Full Text
FI48	Branch Automation News
FI24	Card News
FI12	Corporate EFT Report
FI23	Credit Market Analysis
FI06	Credit Union Regulator
FI11	EFT Report
FI18	Financial Services Report
FI42	LDC Debt Report
FI09	MuniWeek
FI41	Public Finance/ Washington Watch
FI46	SIS Financial Industry Abstracts
FI47	SIS Regional Banking Newsletter
FI50	Thrift Liquidation Alert
FI39	Trading Systems Technology
FI40	Tokyo Financial Wire
Food and Beverage (FB)	
FB04	Ice Cream Reporter
FB02	Washington Beverage Insight
FB03	World Food & Drink Report
General Business (GB)	
GB41	Corporate Jobs Outlook!
GB23	German Business Scope
GB46	Industries in Transition
GB13	Sales Prospector/CA AZ NV HI
GB11	Sales Prospector/CO ID MT OR UT WA WY AK
GB09	Sales Prospector/Canada
GB12	Sales Prospector/GA FL AL NC SC
GB19	Sales Prospector/IL IN
GB15	Sales Prospector/LA MS AR OK KY TN
GB16	Sales Prospector/MD VA WV NC SC DC
GB21	Sales Prospector/MO KS IA NB
GB22	Sales Prospector/NY NJ Southern CT
GB10	Sales Prospector/New England
GB18	Sales Prospector/OH MI
GB08	Sales Prospector/Ohio River Valley
GB14	Sales Prospector/PA DE Southern NJ
GB20	Sales Prospector/TX OK NM
GB17	Sales Prospector/WI MN IA ND SD
Government (GT)	
GT10	Access Reports/Freedom of Information
GT33	Antitrust FOIA Log
GT20	Congressional Activities
GT37	Federal Grants and Contracts Weekly
GT19	FTC FOIA Log
GT17	FTC:Watch
GT39	Federal Employee/Retiree Newsletter
GT36	Federal/Industry Watchdog, The
GT22	Information Report, The
GT30	Liability Week
GT32	National Bureau of Standards Bulletin
Health and Hospital (HH)	
HH14	CDC AIDS Weekly
HH11	Health Care Competition Week
HH01	Health News Daily
HH10	Health Grants and Contracts Weekly
HH04	MMWR Plus* AIDS Alert
HH16	Managed Care Law Outlook
HH12	Managed Care Outlook
HH15	NCI Cancer Weekly
Insurance (IN)	
IN02	IMS Weekly Marketeer
IN06	Insurance Outlook
IN04	Federal & State Insurance Week
International (IT)	
IT15	Africa News
IT18	APS Diplomat
IT81	Asian Economic News
IT87	Atlantic Trade Report
IT44	Central America Update

Table 3. NewsNet's Databases and Online Services (Continued)

IT30	China Express
IT34	China Express Contracts
IT64	Counter-Terrorism Security Intelligence
IT51	East Asian Business Intelligence
IT72	El Salvador On Line
IT04	Exporter, The
IT75	International Information Report
IT26	International Travel Warning Service
IT85	Inter Press International News
IT82	Japanese Investment in U.S. Real Estate
IT66	Japan Free Press
IT24	Japan Weekly Monitor
IT84	Korea High Tech Review
IT52	Kyodo News Service
IT43	Latin American Debt Chronicle
IT23	Mid-East Business Digest
IT50	Middle East Business Intelligence
IT74	Northern Ireland News Service
IT70	Opportunities For Export
IT54	PRS Forecasts: Asia & The Pacific
IT55	PRS Forecasts: Eastern Europe
IT56	PRS Forecasts: Mid-East & North Africa
IT57	PRS Forecasts: North & Central America
IT58	PRS Forecasts: South America
IT59	PRS Forecasts: Sub-Saharan Africa
IT60	PRS Forecasts: Western Europe
IT29	PRS's Political Risk Letter
IT80	Russia Express
IT79	South African Focus
IT83	Southeast Asia High Tech Review
IT86	Southern Africa Review
IT73	SouthScan—Southern Africa
IT65	The Week In Germany
Investext (IX)	
IX01	Aerospace
IX27	Agriculture
IX28	Air Transportation
IX29	Apparel
IX02	Automotive
IX30	Banking
IX31	Beverages
IX03	Biotechnology
IX04	Broadcasting—Cable TV
IX05	Building Materials & Construction
IX06	Chemicals
IX07	Computers and Office Equipment
IX08	Conglomerates
IX32	Containers and Packaging
IX09	Data Processing
IX10	Defense
IX33	Economic Forum
IX11	Electrical and Electronics
IX12	Energy
IX13	Financial
IX14	Food Processing
IX34	Furniture and Fixtures
IX15	Health Care
IX35	Household Appliances
IX16	Insurance
IX36	Iron and Steel
IX37	Leisure and Recreation
IX17	Machinery
IX38	Medical Supply
IX39	Metals
IX40	Mining and Mineral Resources
IX41	Miscellaneous Industries
IX42	Miscellaneous Manufacturing
IX43	Miscellaneous Services
IX44	No Industry
IX45	Paper and Forest Products
IX46	Personal Care Products
IX18	Pharmaceuticals
IX47	Photography
IX19	Printing and Publishing
IX48	Railroads
IX20	Real Estate
IX21	Restaurants & Lodging
IX22	Retailing
IX24	Scientific & Tech Instruments
IX23	Semiconductors
IX49	Ship Building and Water Transportation
IX25	Telecommunications
IX50	Textiles
IX51	Tire & Rubber
IX52	Tobacco
IX53	Trucking
IX26	Utilities
IX54	Wholesale Trade
IX55	Waste Management
Investment (IV)	
IV27	APS Review
IV97T	Bechtel SEC Filings Index
IV06	Biotechnology Investment Opportunities
IV29	Boot Cove Economic Forecast
IV71	Insider Network Market Report
IV51	International BusinessMan News Report
IV50	International Securities Directories
IV48	MPT Review
IV65	NIS Equity Research Service
IV61	RateGram Online
IV34	Trendvest Ratings
IV28	Wall Street S.O.S.
IV53	Wall Street S.O.S. Options Alert
Jiji (JN)	
JN01W	Jiji Press Ticker Service
Law (LA)	
LA11	Bowne Digest—Corp/Sec Article Abstracts
LA04	Industrial Health & Hazards Update
LA15	Law Office Technology Review
LA05	Lawyers' Micro Users Group Newsletter
LA14E	Paul Bernstein's Automated Legal Forms
LA06	Reports of Interest to Lawyers
LA13	Software Law Bulletin, The
Official Airline Guides (OAG)	
Management (MT)	
MT10	Quick Response News
Manufacturing (MG)	
MG12	Advanced Manufacturing Technology
MG15	CAD/CAM Update
MG14	CIMweek
MG19	Comline Japan Daily: Industrial Automation
MG17	Factory Automation News
MG16	Sensors and Instrumentation News
MG13	Sensor Technology
MG18	SMT Trends
Politics (PO)	
PO03	Asian Political News
PO04	Japan Policy and Politics
PO01	Presidential Campaign Hotline
PO02	PACs & Lobbies
PR Newswire (PR)	
PR01W	PR Newswire
Publishing and Broadcasting (PB)	
PB36	Data Broadcasting Report
PB13	Editors Only
PB33	Electronic Services Update
PB15	Friday Memo
PB31	HDTV News
PB37	Inside Market Data
PB30	Morgan Report on Directory Publishing
PB99	NewsNet Action Letter
PB99#	NewsNet's Online Bulletin
PB42	Online Libraries and Microcomputers
PB41	Online Newsletter
PB26	PhotoBulletin
PB17	PhotoMarket
PB12	Photoletter, The
PB04	Public Broadcasting Report
PB01	Television Digest
PB11	Travelwriter Marketletter
PB43	Videonews International
PB39	Video Technology Newsletter
PB44	Worldwide Databases
PB08	Worldwide Videotex Update
Real Estate (RE)	
RE02E	Real Estate & Venture Funding Directory
RE01E	Real Estate Buyers Directory
RE03	Real Estate For Sale Directory
Research and Development (RD)	
RD26	Advanced Coatings and Surface Technology
RD30	Battery & EV Technology
RD31	Electronic Materials Technology News
RD10	Federal Research Report
RD34	Futuretech
RD32	High Tech Ceramics News
RD25	High Tech Materials Alert
RD09	Innovator's Digest
RD28	Inside R&D
RD29	Japan Science Scan
RD23	New Technology Week
RD27	World Report on Advanced Ceramics
Reuters (RN)	
RN01W	Reuter News Reports
Social Sciences (SS)	
SS05	ChurchNews International
SS11	Lutheran News Service
SS14	National Catholic Register
SS07	RNS Daily News Reports
SS06	United Methodist Information
Taxation (TX)	
TX10	CCH Tax Day: Federal
TX13	CCH Tax Day: State
TX15	Small Business Tax Review, The
TX12	Tax Notes Today
Telecommunications (TE)	
TE97	Africa Telecommunications Report
TE14	Applied Networks Report
TE74E	AT&T's Products and Services
TE16	Audiotex Update
TE49	BOC Week
TE72	Cellular Sales & Marketing
TE92	Comline Japan Daily: Telecommunications
TE26	Common Carrier Week
TE01	Communications Daily
TE17	Connect Times
TE22	Data Channels
TE80	EDI News
TE05	Electronic Messaging News
TE81	Enhanced Services Outlook
TE73	Edge On & About AT&T
TE96E	Executive Briefing On State Telecom Laws
TE54	FCC Daily Digest
TE52	FCC Week
TE29	Fiber Optics News
TE95	411 Newsletter
TE90	ISDN News
TE13	Industrial Communications
TE94	Intelligent Network News
TE41	Interactivity Report
TE37	International Cable & Satellite TV News
TE91E	Local Area Networking Sourcebook, The
TE39	Long-Distance Letter, The
TE99	Mobile Data Report
TE20	Mobile Satellite News
TE32	Mobile Satellite Reports
TE25	Mobile Phone News
TE31	NTT Topics
TE55	Netweaver
TE70	New Era: Japan
TE27	Online Product News
TE56	Outlook on AT&T
TE50	Report on AT&T
TE82E	Satellite Directory
TE03	Satellite News
TE47	State Telephone Regulation Report
TE63	TDS Market Report Search
TE62	TDS Tariff Search
TE65	TDS Telecom Calendar
TE98	Telecom Outlook
TE75	Telecommunications Alert
TE11	Telecommunications Reports
TE59	Telecommunications Week
TE83E	Telephone Industry Directory
TE04	Telephone News
TE18	Viewtext
TE02	Voice Technology News
TE77E	Washington Telecommunications Directory
TE93	Worldbeat
TE19	Worldwide Telecom
Transport and Shipping (TS)	
TS12	Japan Transportation Scan
Travel and Tourism (TR)	
TR04	Runzheimer Business Traveler's Letter
TR07	Frequent
TRW Business Profiles (TRW)	
UPI News Wires (UP)	
UP01W	UPI Business & Financial Wire
UP02W	UPI Domestic News Wire
UP04W	UPI International News Wire
UP03W	UPI Political Wire
UP05W	UPI Sports Wire
VU/QUOTE Stock and Commodity Quotes (QUOTE)	
Xinhua (XN)	
XN01W	Xinhua English Language News Service

Networking Services

NewsNet is accessible via the Tymnet and Telenet packet-switching networks at 300, 1200, or 2400 baud, as well as ITT Worldnet, internationally. The subscriber can use any asynchronous ASCII microcomputer, terminal, or word processor equipped with a full-duplex modem. The vendor recommends that an 80-character line length be used to achieve the best results.

On-Line Databases

NewsNet offers more than 400 electronic editions of newsletters and other industry-specific publications generated by more than 200 publishers. Table 3 (Pages OL20-692-104, -105) lists the newsletters and wire services available on-line, broken down by subject area. In many cases, the On-line Databases section of this publication (OL40) contains detailed descriptions of these databases. NewsNet also provides gateways to a number of external databases, including the following:

TRW Business Profiles

TRW Business Profiles provide up-to-date trade payment histories on nearly 10 million businesses, key business facts on more than 400,000 companies, and financial data supplied by Standard & Poor's on over 6,000 of the largest publicly held companies. A typical report includes actual payment histories in 30-, 60-, and 90-day divisions; key business facts such as product lines, number of employees, officers' names, and ownership; and public record data such as tax liens and bankruptcies. According to NewsNet, it is the only company offering TRW credit information on a pay-as-you-go basis—users pay a flat fee for each access.

VU/QUOTE Stocks and Commodities

Through a gateway to VU/QUOTE, a service of VU/TEXT Information Services, NewsNet users can access stock and commodity prices on a 20-minute-delay basis. VU/QUOTE monitors over 5,200 NYSE, AMEX, and NASDAQ (over the counter) stocks and 100 commodities from the major exchanges. For each stock, users receive 23 important, constantly updated trading statistics.

The Official Airline Guides Electronic Edition (OAG)

OAG is an airline flight information system, designed to enable users to control their own travel planning. OAG allows users to choose the most convenient schedule, find the lowest fare, book their own flights, and arrange for tickets from their computer or terminal. Information on overnight accommodations is also available through the system.

OAG contains current information on more than 2 million flight schedules worldwide. It lists over 700,000 North American fares and 90,000 international fares. Schedules and international fares are updated each week; North American fares are updated daily.

Other Services

NewsNet offers one of the industry's top current awareness services—NewsFlash—plus another service that enables users to preview publications at a discounted rate.

NewsFlash

NewsFlash is NewsNet's automatic news clipping service. A current awareness service, NewsFlash lets users continuously monitor all new material added to NewsNet for information of particular interest to them. Users can designate virtually unlimited numbers of keywords or phrases for which NewsFlash will search as new information enters the NewsNet database. In addition, the recently enhanced service includes the following features:

- Complete use of Boolean logic (i.e., And, Or, and Not) qualifiers in creating search strings.
- New keyword phrases are immediately activated.
- Deleted hits are retrievable.
- There is no practical limit to the number of phrases allowed.
- Keyword phrases can be up to 256 characters in length.
- There are extensive options for displaying hits.
- Phrases can be grouped into separate folders.
- Hit displays include line and word counts.
- Users can limit the number of hits a phrase can generate.

- An unlimited number of databases can be selected.

NewsFlash is available to all NewsNet subscribers. Contact the company for further details or for help in creating NewsFlash keyword phrases.

Library

NewsNet also offers a *LIBRARY* feature, whereby a subscriber can read, scan, or search a "sample newsletter" on the NewsNet system. The user, if interested, can then request further details (pricing information, etc.) concerning the specific newsletter. Print copy orders for the newsletter can also be generated using NewsNet's electronic mail service. Library issues can be previewed at NewsNet's basic connect rate of $60/hour at 1200 bps. NewsNet recently enhanced the LIBRARY feature as follows:

- Users can search groups of services—they are no longer limited to accessing only one sample issue at a time.
- The LIBRARY command can now be entered at the Date Option (e.g., when prompted for a date, simply enter LI for library).
- NewsNet is now including more recent sample issues for preview. In many cases, the newsletter's first issue from 1989 is its library issue. ■

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Datapro Research Group. Delran NJ 08075 USA

OCLC Online Computer Library Center, Inc.

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Synopsis

Editor's Note

OCLC Online Computer Library Center, Inc. operates an international computer network used by libraries in 39 countries and territories. More than 10,000 libraries contribute to and/or use information in the *OCLC Online Union Catalog*, which is the largest database of library bibliographic information. The catalog, which now contains more than 21 million records, grows by more than 34,000 records a week. OCLC provides an integrated on-line service, which allows users to enter simple commands at a terminal and retrieve information from the *OCLC Online Union Catalog* and other on-line databases. OCLC also provides **EPIC**, the full-featured on-line reference system that provides subject access, keyword, and Boolean searching. Some of the features **EPIC** provides are browseable indexes, command stacking, saved searches, and on-line help. OCLC's processing center has grown tremendously since our last update. Its computing resources have been expanded from 1 Sigma 9 computer to 18 Sigma 9 computers and four Tandem TXP/VLX systems (including 48 processors).

Report Highlights

OCLC conducts research in four areas: enhancing the use of the *OCLC Online Union Catalog*, positioning the libraries for the future, increasing cataloging productivity, and digitizing data for preservation and information transfer. This report describes current and planned projects in these areas. It also describes OCLC's compact disk reference system, which includes 18 databases under five categories: general reference, education, agriculture, science and technology, and arts and humanities.

Vendor

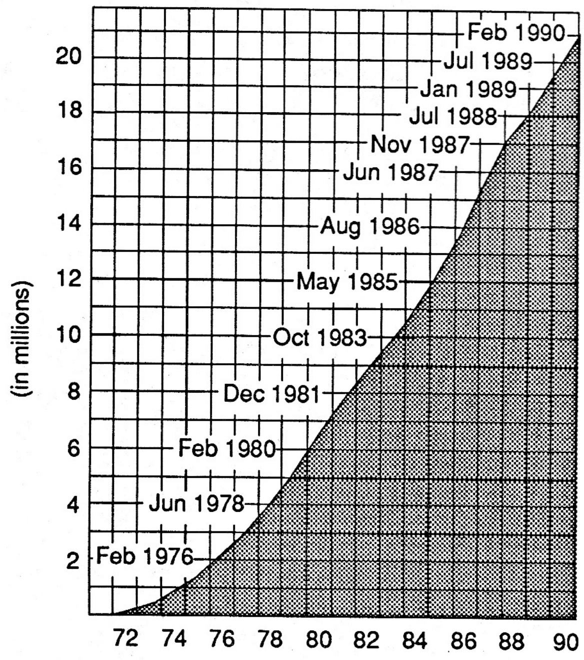
OCLC (Online Computer Library
Center, Inc.)
6565 Frantz Road
Dublin, OH 43017
(614) 764-6000
In Canada:
Contact the U.S. office.

Delran NJ 08075 USA

Analysis

OCLC Online Computer Library Center, a non-profit membership organization, provides computer library services and conducts library-related research. It makes available computer-based processes, products, and services for libraries and other educational organizations and library users. From its Dublin, OH facility, OCLC operates an international computer network that libraries use to acquire and catalog books, order custom-printed catalog cards for card catalogs and machine-readable records for local electronic catalogs, arrange interlibrary loans, and locate library materials. OCLC also provides local mini- and microcomputer-based systems for circulation, acquisitions, and serials control for individual libraries or clusters of libraries and on-line and off-line products and services for electronic information delivery.

Figure 1.
OCLC's Online Union Catalog



OCLC's Online Union Catalog, which now contains more than 21 million records, is the world's largest bibliographic database. It encompasses records in eight formats: books, serials, audiovisual media, maps, archives/ manuscripts, sound recordings, music scores, and machine-readable data files. The database grows by more than 34,000 records a week.

Company Background

OCLC Online Computer Library Center is a non-profit membership organization providing computer-based products, services, and systems to libraries, other educational organizations, and individuals. It was incorporated in 1967 by the Ohio College Association as the Ohio College Library Center. Its mission: develop a computerized regional network for its 54 Ohio college member libraries. In 1977, the organization changed its name to OCLC, Inc. to reflect a broadening of its services to academic, public, special, and federal libraries throughout the U.S. and several foreign countries. Its name was changed again in 1981 to OCLC Online Computer Library Center, Inc.

Member libraries use the OCLC Online System and the OCLC databases to:

- Catalog books, serials, and other library materials on-line
- Order custom-printed catalog cards
- Transact interlibrary loan requests
- Add records to the OCLC Online Union Catalog database
- Place and control acquisition orders
- Generate computer tapes of cataloging records for local computer systems' use or microform catalogs
- Maintain a nationwide computerized file of more than 330 million locations

OCLC is committed to exploring, studying, and participating in technological advances in library and information sciences.

In September 1988, OCLC obtained the rights to the Dewey Decimal Classification (DDC) system by acquiring Forest Press (Albany, NY). The most widely used system of its type, the DDC is used by approximately 200,000 libraries worldwide. OCLC plans to develop an electronic version of the classification system.

Competitive Position

OCLC is the world's largest library information network. Although it is a nonprofit organization, it is self-sustaining; therefore, profitability is an issue. Other companies offer similar processes and products, so OCLC does have competitors.

OCLC's primary competitor is the Research Library Group (RLG), a partnership of major universities and research institutions in the U.S. Its automated information system, RLIN, combines databases and computer systems to support the partnership's cooperative programs. RLG, however, caters to a market niche—research libraries—whereas OCLC has cast a wider net.

While OCLC's growth record is admirable, overall growth is slowing. To extend its reach, OCLC is looking beyond its forte, technical processing (e.g., cataloging and serials control), toward the reference area. Its purchase of Forest Press, and the accompanying rights to the Dewey Decimal Classification system, reflects this new strategy.

The company also created an Electronic Publishing and Information Delivery division. OCLC seeks to fully exploit CD-ROM delivery for its customers. While commercial publishers concentrate on CD-ROM's more or less "sure bets," such as Medline and NTIS, OCLC seeks to publish CD-ROM databases that commercial publishers may not want to bother with. Its Earth Science titles on CD-ROM is an example.

In January 1990, OCLC introduced subject access to its database with the **EPIC** service. **EPIC** is a full-feature on-line reference system that provides subject access and keyword and Boolean searching. The OCLC Online Union Catalog was the first database available over the system; other databases will be added beginning with the more than 850 databases offered by 13 major database hosts through the EasyNet electronic gateway service.

EPIC service features include:

- Keyword and phrase searches including subject fields
- Boolean operators
- Adjacency operators
- Range searching
- Right and internal truncation
- Nested searching
- Browseable indexes
- Multiple record formats
- User-defined formats
- Command stacking
- On-line and off-line prints
- Saved searches
- Practice files
- Estimated time and cost at logoff
- On-line help

Resources and Facilities

Processing Center

OCLC's data center handles its on-line, production, administrative, and software development computing needs. OCLC's on-line environment consists of 18 Sigma 9 computers and four Tandem TXP/VLX systems (comprising 48 processors). One additional Sigma 9 computer and four Tandem TNSII/TXP/VLX systems (comprising 26 processors), two Pyramid computers, and 13 SUN systems provide an environment for development and simulation of the OCLC Online System for testing purposes.

An IBM 3090 supports the production environment and the on-line **EPIC** service. Attached to the IBM mainframe are IBM 3480 cartridge tape devices and a large disk storage subsystem, six IBM 3203 impact printers for printing catalog cards, and a Xerox 8700 laser printer.

Other systems include three Data General MV/20000 computers supporting financial and administrative functions, two Digital Equipment VAX systems supporting administrative order-processing functions, and two Data General MV/6000 computers supporting the LS/2000 Production/Development facility.

Operating hours for its Online System are Monday through Friday, 6 a.m. to 11 p.m. (EST) and Saturday, 8 a.m. to 8 p.m. (EST), except for certain recognized holidays. **EPIC** on-line service hours are 6 a.m. to 10 p.m. (EST), Monday through Friday and 8 a.m. to 8 p.m. (EST) Saturday, except for certain recognized holidays.

OCLC's current on-line system is entering its nineteenth year of service, approaching a daily transaction rate of 3 million messages. OCLC is now developing a new on-line system that will enhance current services and permit new applications. OCLC is also modernizing its telecommunications network, working with US Sprint to develop a network based on packet-switching technology. Through this technology, OCLC can increase network capacity, accommodate larger messages and increased traffic, and link more easily with other networks.

Systems Software
OCLC provides on-line services to its member libraries; it does not provide general computer services.

Customer Support Services
OCLC provides customer support services through its Marketing and User Services Division in Dublin, OH and through local network staffs. Its staff and regional networks provide training and technical assistance.

OCLC publishes *OCLC Micro*, a bimonthly magazine covering OCLC workstations, IBM Personal Computers and other microcomputers, software, and related services. It also includes information on commercial software packages, system operating pointers, and articles on using library applications.

Sales and Marketing Services
OCLC maintains sales and marketing staffs in these network offices:

- OCLC—Dublin, OH
- OCLC Pacific (PACNET)—Rancho Cucamonea, CA; Portland, OR; Seattle, WA
- OCLC Europe—Birmingham, England

OCLC primarily markets its services through regional networks—organizations that contract with OCLC to provide services to member libraries.

Current regional networks include:

- Amigos (Amigos Bibliographic Council)—Dallas, TX
- BCR (Bibliographical Center for Research)—Denver, CO
- BCR Ames Office—Ames, IA
- Capcon (Consortium of Universities of the Washington Metropolitan Area)—Washington, DC
- FEDLINK (Federal Library Committee)—Washington, DC
- ILLINET (Illinet Bibliographic Data Base Service)—Springfield, IL
- INCOLSA (Indiana Cooperative Library Services Authority)—Indianapolis, IN
- MLC (Michigan Library Consortium)—Lansing, MI
- MINITEX (Minnesota Interlibrary Telecommunications Exchange)—Minneapolis, MN
- MLNC (Missouri Library Network Corporation)—St. Louis, MO
- NEBASE (Nebraska Library Commission)—Lincoln, NE
- NELINET, Inc.—Newton, MA
- OCLC/Europe—United Kingdom
- OHIONET—Columbus, OH
- PACNET (OCLC Pacific Network)—Claremont, CA
- PACNET (OCLC Pacific Network)—Portland, OR
- PACNET (OCLC Pacific Network)—Bremerton, WA
- Palinet—Philadelphia, PA
- PRLC (Pittsburgh Regional Library Center)—Pittsburgh, PA
- SOLINET (Southeastern Library Network)—Atlanta, GA
- SUNY (State University of New York)—Albany, NY
- WILS (Wisconsin Interlibrary Services)—Madison, WI

OCLC's products and services are available internationally through OCLC Europe and OCLC Asian/Pacific Services. Based in Birmingham, England, OCLC Europe coordinates OCLC library automation services to the United Kingdom and Europe. OCLC Asian/Pacific Services, based in Dublin, OH, extends OCLC automation services to the library community of the Asian/Pacific region.

Application-Specific Services

OCLC's product line is specifically designed to assist libraries and other organizations in the information industry. Product descriptions follow.

Library Services

The OCLC Online System provides a Name-Address Directory and the following Online System subsystems:

- Cataloging
- Interlibrary Loan
- Serials Union Listing

Cataloging provides access to the Online Union Catalog and Library of Congress (LC) Name-Authority File, allowing member libraries to find catalog information for more than 21 million books, serials, maps, music scores, and audiovisual media.

This service provides quick, efficient, cost-effective cataloging. Libraries may order catalog cards, accessions lists, and magnetic tapes for their own catalogs. Members may modify existing records to conform to their specific cataloging requirements; changes do not alter the master records in the OCLC databases.

Name-Authority File consists of LC Name-Authority records for personal, corporate, conference geographic names and uniform title headings.

OCLC Cataloging Micro Enhancer allows unattended access to the *OCLC Online Union Catalog*. It also allows selected OCLC users to add data to, and correct data in, bibliographic records and to replace those records in the Online Union Catalog. Users can also perform author searches during prime time and can access uniform title fields in the Name-Authority File.

Major Microforms Project provides to OCLC members and nonmembers shared cataloging of significant microform sets. The project's goals are to encourage institutions to catalog the individual titles of a major microform set and to allow other institutions to order designated services and products for the cataloged sets.

ILL (Interlibrary Loan) enables libraries to create, transmit, and file loan requests rapidly and efficiently. Since each record in the OCLC Online Union Catalog also contains location information, member libraries can easily request loan material from specific libraries.

More than 3,300 ILL users enter an average of 63,000 requests per week. More than 90 percent of the requests are verified on-line, and 87 percent are filled and items shipped to borrowers within an average of six days.

The ILL Micro Enhancer software package streamlines ILL Subsystem processing, saving time by automating the following processes: batch updating and printing of interlibrary loan requests, overdue notices, renewal requests, and recall notices.

The ILL Micro Enhancer is compatible with the following microcomputers: all OCLC workstations and the IBM PC, XT, and AT.

Loan records are accessible through several search keys, including title, author/title, ILL transaction number, patron name, identification number, and local call number.

Group Access Capability allows non-OCLC members to issue and receive interlibrary loan requests via the OCLC Online System. All members of cooperative ILL groups, even those libraries not cataloging with OCLC, can use the ILL Subsystem to communicate with one another.

Serials Union Listing provides a cost-effective way to create, maintain, and distribute serials union list information. The feature automatically builds union list displays from information in member institutions' local data records. Printed union lists are available in paper, microfiche, and tape versions. Serials control users can belong to an unlimited number of union list groups and use the displays of any union list group and its members. There are now 100 union list groups consisting of over 6,400 participating libraries.

Serials Control 350 is a microcomputer-based local serials system, facilitating handling of bibliographic control, check-in, claiming, binding, routing, ordering, and fund management. The SC350 system runs on a personal computer with a minimum of 640K bytes of RAM, a 40M-byte hard disk, and DOS 3.2 or higher and links to the LS/2000 local library system. This system is linked to the OCLC Online Union Catalog, Name-Address Directory, and state and regional Union List.

OCLC's ACQ350 acquisitions system offers libraries local processing and resource sharing. The ACQ350 is a microcomputer-based acquisitions system that handles all bibliographic formats and order types. It enables staff members to batch tasks—including preorder, in-process, and postreceipt. The system mirrors the work flow of a typical acquisitions department to achieve more efficient processing. Users can configure multiple workstations to access local databases and share ACQ350 and SC350 software using local area networking capabilities (available from OCLC).

Name-Address Directory (NAD) is an on-line file system containing names, addresses, and communications and policy information for libraries, publishers, and vendors. The Name-Address Directory is connected with other OCLC Online Systems to allow members to access reference information. This system provides up-to-date information on domestic and foreign vendors and reduces processing and mailing time for acquisitions.

Retrospective Conversion Service allows conversion of records directly from shelf list or other card files. OCLC can enter and edit local information, convert headings into AACR2- or AACR2-compatible form, and enter new records into the Online Union Catalog.

The cost for the cataloging subsystem depends on the access and use of records and location information already in the Online Union Catalog. System resources (connect time or computer time) used is not a factor.

A library is charged for its access and first-time use of a bibliographic record in the database (if the library did not enter the record). Charges are lower for libraries that add their holdings to existing records as part of a recognized retrospective conversion project; a credit is given for original cataloging (contributing new bibliographic records) and the enhancement of minimal-level records.

Other expenses include dedicated-line or dial-access telecommunications costs and the price of catalog cards, OCLC-MARC tapes, terminals, service fees, and any network charges.

Charges for using the Interlibrary Loan Subsystems are levied on a per-transaction basis. Libraries filling ILL Subsystem requests receive a credit. Requests for bibliographic and location information from the Online Union Catalog are charged separately. In addition, each serials union list group is charged a small start-up fee. Hard copy products carry a separate charge based on quantity ordered and, in some cases, frequency of receipt.

OCLC is developing a new product with Auto-Graphics called SharePac. SharePac will combine Auto-Graphics' CD-ROM-based public access catalog with the OCLC ILL Subsystem. GovDoc is a new cataloging service for federal depository libraries.

Microcomputer Software/Services

The OCLC M310 Workstation is a DOS-compatible, 80286-based microcomputer to which OCLC has added library-related functions.

This workstation is used to:

- Ease access to the OCLC system
- Enhance on-line system use with the Cataloging and ILL Micro Enhancer software packages
- Expand library services and increase local processing capabilities with optional software packages

The OCLC M386/16 Workstation is a DOS-compatible, 80386-based microcomputer. It features the same library-related functions as the M310.

The **OCLC Terminal Software** is a general-purpose communications program supporting access to OCLC Online System. This is the same program that is included with OCLC workstations.

It provides the following capabilities:

- Automatic dial-up and logon to OCLC Online System
- Basic text editing
- Eliminates the need to reenter fields when editing
- Saves full-screen displays on disk
- Provides function keys that streamline data entry

Networking Services

Libraries can communicate with the OCLC Online System through either a dedicated line or dial access. Libraries selecting dedicated-line communications often use one or more OCLC subsystems frequently or for long periods throughout the day. Dial-access communication is the best option for less frequent users.

Two access modes are available to dial-access users: CompuServe's value-added network or direct dial (local direct dial or direct dial WATS).

On-Line Databases

OCLC's databases are geared to libraries. Detailed information on most of the databases may be found in the On-line Databases section (OL40) in Volume 2 of this publication.

Miscellaneous

LC Authority Files	contain more than 2 million personal, corporate, conference, and geographic names and uniform titles from the Name-Authority File and more than 200,000 records from the Subject Authority File. The database also contains the currently acceptable form of a name and from and see-also-from information. Many records contain the AACR2 name forms.
NAD (Name-Address Directory)	contains names, addresses, and communications and policy information about libraries, publishers, vendors, and other organizations in the information industry. Name-Address records consist of organization records and unit records generated by OCLC participants, OCLC staff, and others who are specially authorized to do so.
Organization Records	are generic records describing an overall organization; for example, a vendor's corporate offices, university libraries, or professional associations. Unit records describe distinct communications addresses within an organization, such as an office or department. Organization and unit records can be retrieved through several search keys.
Online Union Catalog	contains more than 21 million bibliographic records in Machine-Readable Cataloging (MARC) formats. These records contain information on the following: books, serials, audiovisual media, machine-readable data files, manuscripts, maps, music scores, and sound recordings. Approximately 35,000 records are added each week, with bibliographic information coming from these sources: • Member libraries through on-line entry and through batch loading of machine-readable tapes • LC MARC Distribution Service, the largest single contributor to the database • National Library of Medicine CATLINE tapes

The Online Union Catalog contains data in a variety of languages.

CD-ROM Products

OCLC's compact disk reference system offers 18 databases under five categories:

1. General Reference
2. Education
3. Agriculture
4. Science and Technology
5. Arts and Humanities

OCLC has developed a microcomputer-based compact disk cataloging system with subsets drawn from the Online Union Catalog (OLUC). It includes bibliographic and authority subsets and allows users to go on-line for records not found on compact disk.

Future Plans

OCLC recently announced plans to develop an online electronic journal of scientific information in conjunction with the American Association for the Advancement of Science. Other strategic alliances are in negotiation, all following OCLC's fundamental objective of furthering access to information and reducing the rate at which library costs rise. ■

ORBIT Search Service

COMPANY INFORMATION

ORBIT Search Service, A Div. of Maxwell Online, Inc.
8000 Westpark Drive
McLean, Virginia 22102 (703) 442-0900, (800) 456-7248

UPDATE: *Since our July 1988 update ORBIT has reorganized. ORBIT Search Service is now one of three divisions of Maxwell Online Inc., which is part of Maxwell Communication Corporation/Macmillan Inc. ORBIT's on-line focus has also changed. It is now stressing its patent, health and safety, environment, and materials science databases and deemphasizing its business files. All of these categories and more are covered in the On-line Database section of this report.*

ORBIT Search Service is a division of Maxwell Online, Inc., the on-line arm of Maxwell Communication Corporation/Macmillan Inc. Maxwell Online's other divisions include BRS Information Technologies and the Pergamon Search Center. ORBIT itself provides on-line access to more than 100 databases for scientists and researchers in the fields of chemistry, energy, engineering, materials, and patents. BRS Information Technologies is covered in its own report: OL20-106-101.

REPORT HIGHLIGHTS: PAGE
Competitive Position 102
On-Line Databases 103

Company Background

Founded in 1965, ORBIT Search Service is one of the oldest on-line services; it is particularly well known among information professionals. Founded as SDC Search Service, ORBIT was originally a part of the Rand Corporation. Over the years, the company underwent several name changes. In 1981 the Burroughs Corporation (now Unisys) bought it. In 1986 Maxwell Communications acquired it.

In early 1989, Macmillan, Inc. purchased BRS Information Technologies. With ORBIT Search Service and BRS, Macmillan created a new company called Maxwell Online, Inc. With nearly 300 databases between the two divisions, Maxwell Online became the second largest database vendor behind DIALOG. Maxwell Online plans to eventually integrate the operations of BRS and ORBIT into one service.

With its collection of more than 100 databases, ORBIT has become a leading source for on-line patent, scientific, and technical information. ORBIT offers many databases in the areas of patents, chemistry, energy and earth sciences, materials, health, safety and the environment, and engineering and electronics.

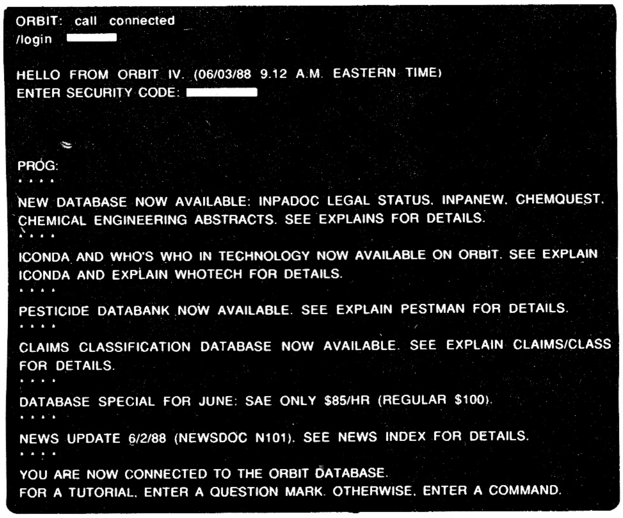
The other division of Maxwell Online, BRS Information Technologies, offers four product lines: BRS/Search Service, BRS Colleague, BRS/After Dark, and BRS/SEARCH. These have made BRS one of the leading on-line hosts serving the medical community and the academic library market.

Rounding out the Maxwell Online team is Pergamon Search Center.

ORBIT Search Service does not offer general, on-line data processing services. Accessing its information is possible only through its proprietary information retrieval system. This system is optimized for indexing and retrieval of large files of documents such as newspaper articles, speeches, journal articles, books, reports, and government documents.

ORBIT Search Service obtains its data from information producers worldwide including government agencies, professional and academic societies, and private information companies. ORBIT's staff analyzes raw information and enters it into ORBIT's information retrieval system for optimal retrieval.

ORBIT also offers a Private File Service that enables a customer to input data on the Orbit Retrieval System for private access. Its Sponsored File Service allows an information producer to market a file to a specified subscriber base. In addition, the ORBIT text retrieval software is for sale as an installed in-house database management package.



```
ORBIT:  call  connected
/login [redacted]

HELLO FROM ORBIT IV. (06/03/88 9.12 A.M. EASTERN TIME)
ENTER SECURITY CODE: [redacted]



PROG:
. . . .
NEW DATABASE NOW AVAILABLE: INPADOC LEGAL STATUS. INPANEW. CHEMQUEST.
CHEMICAL ENGINEERING ABSTRACTS. SEE EXPLAINS FOR DETAILS.
. . . .
ICONDA AND WHO'S WHO IN TECHNOLOGY NOW AVAILABLE ON ORBIT. SEE EXPLAIN
ICONDA AND EXPLAIN WHOTECH FOR DETAILS.
. . . .
PESTICIDE DATABANK NOW AVAILABLE. SEE EXPLAIN PESTMAN FOR DETAILS.
. . . .
CLAIMS CLASSIFICATION DATABASE NOW AVAILABLE. SEE EXPLAIN CLAIMS/CLASS
FOR DETAILS.
. . . .
DATABASE SPECIAL FOR JUNE: SAE ONLY $85/HR (REGULAR $100).
. . . .
NEWS UPDATE 6/2/88 (NEWSDOC N101). SEE NEWS INDEX FOR DETAILS.
. . . .
YOU ARE NOW CONNECTED TO THE ORBIT DATABASE.
FOR A TUTORIAL. ENTER A QUESTION MARK. OTHERWISE. ENTER A COMMAND.
```

Figure 1. ORBIT's welcome screen.

ORBIT Search Service

Competitive Position

ORBIT, which has had a succession of owners during its 25-year history, has been stable since September 1986 when Maxwell Communications acquired it. It is now part of Maxwell's online arm (Maxwell Online, Inc.), which has two operating divisions: ORBIT Search Service and BRS Information Technologies. (Maxwell acquired ORBIT's former competitor, BRS Information Technologies, in January 1989.)

Together, BRS and ORBIT offer nearly 300 databases and serve more than 60,000 "active passwords" worldwide. ORBIT specializes in scientific and patent databases, while BRS' specialties are medical and education databases. Maxwell plans to shift BRS' focus from a database vendor to strictly software development.

In some ways, ORBIT has never been better off. Under previous owner Burroughs (now Unisys), it stagnated, while competitors such as DIALOG grew. Under Maxwell, ORBIT finally has the financial backing it lacked under its previous owners. Maxwell, with 1988 revenues of just over $2 billion, is one of the world's top 10 media companies. ORBIT is part of a publishing empire that includes Macmillan (primarily book publishing), Pergamon (journals), Standard Rate and Data (media information), Que Corporation (computer books), Berlitz (worldwide language schools), and Official Airline Guides (air travel information). Maxwell feels the electronic information industry has great potential, and plans to be in the business for the long haul.

Consequently, Maxwell is taking steps to compete effectively. Its goal, according to its advertisements, is "To be the international leader in online services specializing in patent, biomedical, scientific, and technical information." The company, under the direction of industry veteran Jim Terragno, is developing a new search software program that will serve as a model user interface for the 1990s and beyond.

ORBIT's main competitors are DIALOG and STN. DIALOG is especially formidable. With revenues of roughly $100 million, it is more than twice the size of BRS and ORBIT combined. While it has many science-technology files, it has also set its sights on the larger, corporate market. DIALOG may be willing to concede niche markets to its competitors if it is successful in infiltrating the end-user market. STN is also a leading vendor of technical files. It does not, however, have the financial backing of a Maxwell (or in DIALOG's case, a Knight-Ridder).

RESOURCES AND FACILITIES

Processing Center

During 1989, ORBIT will relocate its data center from Reston, Virginia to a new data center at the Official Airline Guides (OAG) headquarters in suburban Chicago, Illinois. BRS Information Technologies will share this same facility. The new data center offers a number of advantages including increased processing capacity, extensive network monitoring facilities, and a back-up power supply which will prevent any disruption of service in the event of a power failure. The entire operation is being planned so the move will be transparent to users.

Systems Software

In April 1989, Maxwell Online, Inc. selected Hierarchical Tree Structure Search (HTSS) as its structure search software. ORBIT Search Service will use HTSS to provide access to over 3.5 million structures in the *Beilstein* database and other ORBIT chemical files.

Maxwell Online said it chose HTSS because of its flexibility, speed, and precision. The system's unique architecture provides excellent response time even from large databases. HTSS handles complicated Markush queries and still responds quickly, according to Maxwell Online. The software is user friendly, enabling searchers to use a multiwindow function to define a window that contains the starting structure and display in a side-by-side window, the resulting structure and/or text.

HTSS is available either as a database management PC package or as a VAX or IBM mainframe product. ORAC, Ltd. a subsidiary of Maxwell Communication Corporation plc markets and supports it.

ORBIT includes several advanced information retrieval facilities to simplify search specification and control. These facilities are described below.

- Proximity searching allows right, middle, or left truncation in searches and can be combined with Boolean, linked, or nested logic.
- ORBIT's GET command is a powerful system feature which enables the user to perform on-line statistical analysis of search results.
- Neighbor terms allow the user to select individual or groups of search terms without rekeying.
- Cross-file searching allows the user to directly transfer up to 2,000 terms from the print records of one file to another for searching without rekeying.
- The temporary file search feature allows the user to temporarily transfer from one database to another without losing original search results.

LANGUAGES: Due to the nature of the ORBIT Search Service, users are not generally involved in programming.

Customer Support Services

ORBIT Search Service provides introductory, review, advanced, and special subject workshops designed to train clients to efficiently formulate their search requests to obtain maximum advantage from the ORBIT system. Clients with special needs can arrange for custom training sessions at their sites.

For patent searchers, ORBIT provides custom searching and document delivery with the Pergamon Search Center and Patent Copy Services. ORBIT is also a source for printed patent publications, including *Patent Abstracts of Japan in English*; the *International Patent Classification*; and *World Patent Information* (an international journal of patent information and industrial innovation).

ORBIT's monthly newsletter, *Searchlight*, provides information on new system features, databases, and search techniques.

ORBIT Search Service maintains an Action Desk, accessible via a toll-free number, (800) 456-7248, or (800) 45-ORBIT outside Virginia and the Washington, DC metropolitan area. Staff members answer questions and provide advice on system usage.

Sales and Marketing Services

ORBIT's headquarters are in McLean, Virginia. In addition, ORBIT maintains field offices in Houston, Texas and Berkeley, California. Internationally, ORBIT has offices in London, England; Potts Point, Kronberg, Germany; NSW Australia; and Tokyo, Japan.

Two factors affect the cost of searching on ORBIT. The first is *computer connect-time* charged by the hour or part-hour, which varies with the file being searched. The second factor is for some databases there is a *per-citation charge* for off-line, and sometimes on-line, printing (see Table 1, Pages OL20-720-103 and -104).

NETWORKING SERVICES

ORBIT's files are accessible through either the Telenet or Tymnet worldwide telecommunications networks. For users in North America, telecommunications charges appear as separate items on the ORBIT invoice.

The ORBIT Information Retrieval System communicates at 300, 1200, or 2400 bits per second (bps) with terminals or microcomputers that are compatible with the network carriers.

ON-LINE DATABASES

ORBIT offers access to more than 100 databases. Brief descriptions of their content follows. The *filename* follows the database name when they differ from one another.

In many cases, more in-depth information on these databases can be found in the On-line Databases section (OL40) of this publication.

Biotechnology

Biotechnology Abstracts—produced by Derwent Publications Ltd., provides coverage of all technical aspects of biotechnology such as genetic manipulation, biochemical engineering to fermentation and downstream processing, industrial use of microorganisms, inplant breeding, cell hybridization, and industrial waste management and related fields.

The sources include over 1,000 scientific and technological journals, conference proceedings, and international patent literature. The file dates from July 1982 to the present and contains approximately 81,000 records.

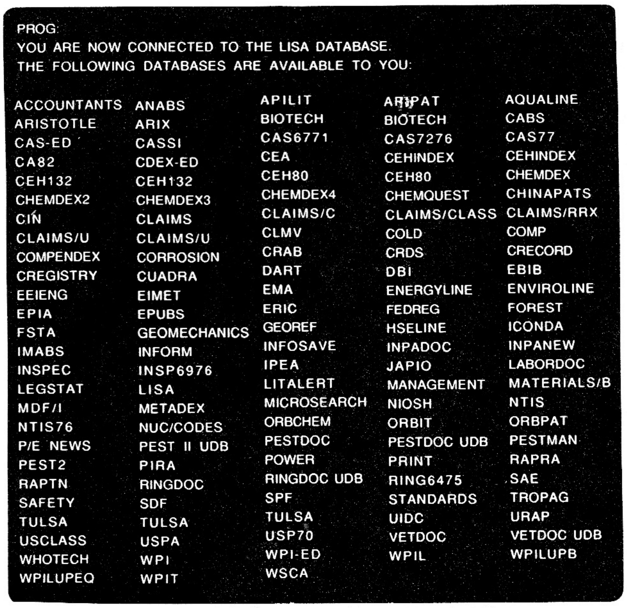
Current Awareness in Biological Sciences—provides information on the whole field of the biological sciences. Subjects include biochemistry, cell biology, genetics, microbiology, plant science, physiology, toxicology, cancer research, neuroscience, developmental biology, endocrinology, and environmental sciences.

Coverage starts in 1983 and the file contains about 1 million records.

Business

ABI/Inform—an index to the articles appearing in approximately 800 business-related periodicals, covers topics such as accounting, advertising, banking, data processing, economics, employee benefits, finance, insurance, international trade, labor relations, marketing, operations research, real estate, social conditions, statistics, business law, stocks and bonds, taxes, and training and education.

The database expands by about 30,000 citations per year and covers the period from 1971 to the present.



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PROG:
YOU ARE NOW CONNECTED TO THE LISA DATABASE.
THE FOLLOWING DATABASES ARE AVAILABLE TO YOU:

ACCOUNTANTS  ANABS          APILIT         APIPAT          AQUALINE
ARISTOTLE    ARIX           BIOTECH        BIOTECH         CABS
CAS-ED       CASSI          CAS6771        CAS7276         CAS77
CA82         CDEX-ED        CEA            CEHINDEX        CEHINDEX
CEH132       CEH132         CEH80          CEH80           CHEMDEX
CHEMDEX2     CHEMDEX3       CHEMDEX4       CHEMQUEST       CHINAPATS
CIN          CLAIMS         CLAIMS/C       CLAIMS/CLASS    CLAIMS/RRX
CLAIMS/U     CLAIMS/U       CLMV           COLD            COMP
COMPENDEX    CORROSION      CRAB           CRDS            CRECORD
CREGISTRY    CUADRA         DART           DBI             EBIB
EEIENG       EIMET          EMA            ENERGYLINE      ENVIROLINE
EPIA         EPUBS          ERIC           FEDREG          FOREST
FSTA         GEOMECHANICS   GEOREF         HSELINE         ICONDA
IMABS        INFORM         INFOSAVE       INPADOC         INPANEW
INSPEC       INSP6976       IPEA           JAPIO           LABORDOC
LEGSTAT      LISA           LITALERT       MANAGEMENT      MATERIALS/B
MDF/I        METADEX        MICROSEARCH    NIOSH           NTIS
NTIS76       NUC/CODES      ORBCHEM        ORBIT           ORBPAT
P/E NEWS     PEST II UDB    PESTDOC        PESTDOC UDB     PESTMAN
PEST2        PIRA           POWER          PRINT           RAPRA
RAPTN        RINGDOC        RINGDOC UDB    RING6475        SAE
SAFETY       SDF            SPF            STANDARDS       TROPAG
TULSA        TULSA          TULSA          UIDC            URAP
USCLASS      USPA           USP70          VETDOC          VETDOC UDB
WHOTECH      WPI            WPI-ED         WPIL            WPILUPB
WPILUPEQ     WPIT           WSCA
```

Figure 2. ORBIT searchers can retrieve a list of available databases, while on-line, by typing "Files."

ORBIT Search Service

Database Name	Filename	Connect ($/hr)	Off-Line Prints Prt/Prt (full or tailored) ($)	On-Line Prints Prt/Prt (full or tailored) ($)	SDI Base Charge ($)	Frequency
ABI/INFORM	INFORM	105	1.05/1.05	0.80/0.80	8.50	Monthly
ACCOUNTANTS	ACCOUNTANTS	85	0.45/0.50	0.40/0.45	—	—
ANALYTICAL ABSTRACTS	ANALYTICA	90	0.50/0.50	0.85/0.85	7.50	Monthly
*APILIT	APILIT					
SUBSCRIBERS		110	0.40/0.40	0.35/0.35	3.45	Monthly
NONSUBSCRIBERS		160	0.55/0.55	0.50/0.50	—	—
*APIPAT	APIPAT					
SUBSCRIBERS		110	0.40/0.40	0.35/0.35	3.45	Monthly
NONSUBSCRIBERS		160	0.55/0.55	0.50/0.50	—	—
AQUALINE	AQUALINE	96	0.55/0.55	0.40/0.45	8.00	Biweekly
*BIOTECHNOLOGY	BIOTECH					
SUBSCRIBERS		80	0.33/0.33	0.18/0.18	8.00	Monthly
NONSUBSCRIBERS		127	0.50/0.50	0.30/0.45	8.00	Monthly
CERAMIC ABSTRACTS	CERAB	95	0.35/0.35	0.25/0.25	6.00	Bimonthly
†CHEMICALABSTRACTS	CAS82/CAS77/ CAS7276/CAS6771	98	0.50/0.50	0.45/0.45	8.50	Biweekly[1]
	CAS-ED	15	0.45/0.45	NC/NC	—	—
†CHEMICAL ABSTRACTS SOURCE INDEX	CASSI	120	0.50/0.50	0.45/0.45	9.50	Quarterly
†CHEMICAL DICTIONARY	CHEMDEX/CHEMDEX2/ CHEMDEX3/CHEMDEX4	172	0.50/0.50	0.45/0.45	—	—
	CHEMDEX-ED	15	0.45/0.45	NC/NC	—	—
**CHEMICAL ECONOMICS HANDBOOK	CEH80					
MAJOR SUBSCRIBERS		80	NC/1.00	NC/0.75	—	—
MINOR SUBSCRIBERS		130	NC/3.25	NC/3.00	—	—
*CEH INDEX	CEHINDEX					
MAJOR SUBSCRIBERS		80	NC/0.10	NC/NC	—	—
MINOR SUBSCRIBERS		130	NC/0.15	NC/0.05	—	—
CHEMICAL ENGINEERING ABSTRACTS	CEA	105	0.50/0.50	0.85/0.85	6.50	Monthly
†CHEMICAL INDUSTRY NOTES	CIN	110	0.50/0.50	0.40/0.40	6.50	Weekly
**CHEMICAL REACTIONS DOCUMENTATION SERVICE (SUBSCRIBERS ONLY)	CRDS	105	0.25/0.0.25	0.25/0.25	8.00	Quarterly
CHEMICAL SAFETY NEWSBASE	CSNB	85	0.70/0.70	0.40/0.40	5.50	Monthly
CHEMQUEST	CHEMQUEST	115	0.50/0.60	0.35/0.45	—	—
CHINAPATS	CHINAPATS	125	0.45/0.45	0.45/0.45	8.00	Monthly
CLAIMS	CLAIMS	125	0.25/0.50	0.125/0.25	7.50	Weekly
CLAIMS CLASSIFICATION	CLAIMS/CLASS	95	0.10/0.10	NC/NC	—	—
CLAIMS COMPOUND REGISTRY	CREGISTRY	95	0.075/0.15	NC/NC	—	—
CLAIMS COMPREHENSIVE SUBSCRIBERS	CLAIMS/C	300	0.15/0.50	NC/0.25	7.50	Weekly[2]
CLAIMS REASSIGNMENTS	CLAIMS/RRX	105	4.00	3.00	7.50	Bimonthly
CLAIMS UNITERM	CLAIMS/U	300	0.15/0.50	NC/0.25	7.50	Weekly[2]
COLD	COLD	90	0.35/0.40	0.20/0.25	4.95	Quarterly
COMPENDEX PLUS	COMPENDEX PLUS	108	0.47/0.47	0.35/0.35	6.50	Monthly
CORROSION	CORROSION	91	1.10/1.10	0.80/0.80	—	—
CUADRA DIRECTORY OF ONLINE DATABASES	CUADRA	75	0.85/0.85	0.75/0.75	—	—
CURRENT AWARENESS IN BIOLOGICAL SCIENCES	CABS	100	0.35/0.35	0.15/0.15	6.00	Monthly
DATABASE INDEX	DBI	45	0.10/0.10 0.10 prt rank	0.05/0.05 0.05 prt rank	—	—
DIRECTORY OF AMERICAN RESEARCH & TECHNOLOGY	DART	102	0.50/0.50	0.35/0.40	—	—
ELECTRIC POWER INDUSTRY ABSTRACTS	EPIA	86	0.25/0.25	0.15/0.15	—	—
ELECTRONIC PUBLISHING ABSTRACTS	EPUBS	115	0.35/0.55	0.30/0.50	8.50	Biweekly
ENERGY BIBLIOGRAPHY	EBIB	80	0.35/0.35	0.25/0.25	—	—
ENERGYLINE	ENERGYLINE	116	0.45/0.45	0.45/0.45	6.95	Monthly
ENGINEERED MATERIALS ABSTRACTS	EMA	90	0.45/0.45	0.45/0.45	8.00	Monthly

NC—No charge.

**Access to these databases in nonrestricted, but lower rates apply to customers in the subscriber category. Contact the ORBIT Search Service Action Desk for more information.*

***These databases are available on a restricted basis. contact you local ORBIT Search Service Action Desk for more information.*

†Search terms (excluding /RN)—0.33/term; extracted prints—0.03/record selected.

[1] *CAS82 only.*

[2] *UP Update—SDI's also available on UPI update.*

[3] *INSPEC only.*

[4] *NTIS only.*

[5] *PESTDOC UDB and PESTDOC II UDB only.*

[6] *RINGDOC UDB only.*

[7] *VETDOC UDB only.*

[8] *UP Basic Update—SDI's also available on UPEQ, UPA, and UPB updates.*

Table 1. ORBIT Search Service's 1989 price schedule.

ORBIT Search Service

Database Name	Filename	Connect ($/hr)	Off-Line Prints Prt/Prt (full or tailored) ($)	On-Line Prints Prt/Prt (full or tailored) ($)	SDI Base Charge ($)	Frequency
ENVIRONLINE	ENVIRONLINE	116	0.45/0.45	0.45/0.45	6.95	Monthly
ERIC	ERIC	35	0.14/0.14	0.10/0.10	2.95	Monthly
FEDERAL REGISTER	FEDREG	82	0.20/0.20	0.10/0.10	7.95	Weekly
FOOD SCIENCE AND TECHNOLOGY ABSTRACTS	FSTA	80	0.25/0.35	0.25/0.35	4.95	Monthly
FOREST	FOREST	98	0.35/0.35	0.20/0.20	—	—
GEOLOGICAL REFERENCE	GEOREF	87	0.45/0.45	0.40/0.40	6.50	Monthly
GEOMECHANICS ABSTRACTS	GMA	110	0.50/0.50	0.30/0.30	7.50	Bimonthly
HEALTH & SAFETY EXECUTIVE	HSELINE	75	0.45/0.45	0.30/0.30	6.50	Monthly
ICONDA	ICONDA	113	0.51/0.51	0.36/0.36	8.00	Monthly
IMAGING ABSTRACTS	IMAS	111	0.55/0.55	0.40/0.45	7.50	Bimonthly
INPADOC	INPADOC	120	0.40/0.40	0.20/0.20	8.00	Weekly
FAMILY SEARCHING		20/search				
INPANEW	INPANEW	130	0.40/0.40	0.20/0.20	8.00	Weekly
INSPEC	INSPEC/INSP6976	110	0.60/0.60	0.53/0.53	6.55	Biweekly[3]
IPABASE	IPABASE	120	0.35/0.40	0.30/0.35	6.50	Quarterly
ISTP SEARCH	ISTP SEARCH	95	1.25/1.75	1.25/1.75	8.00	Monthly
JAPIO	JAPIO	150	0.25/0.45	0.15/0.25	6.50	Monthly
LABORDOC	LABORDOC	110	0.50/0.50	0.25/0.25	6.50	Monthly
LEGAL STATUS	LEGSTAT	125	4.00/4.00	3.00/3.00	8.00	Weekly
LIBRARY & INFORMATION SCIENCE ABSTRACTS	LISA	75	0.35/0.35	0.35/0.35	5.95	Monthly
LITALERT	LITALERT	100	5.00/5.00	4.50/4.50	8.50	Weekly
MATERIALS BUSINESS FILE	MATERIALS/B	90	0.45/0.45	0.40/0.40	8.00	Monthly
METADEX	METADEX	90	0.45/0.45	0.40/0.40	8.00	Monthly
METALS DATA FILE	MDF/I	75	NA/3.00 2.50 prt spec	NA/2.75 2.25 prt spec	5.95	Monthly
MICROSEARCH	MICROSEARCH	75	0.25/0.25	0.20/0.20	—	—
NATIONAL INSTITUTE FOR OCCUPATIONAL HEALTH & SAFETY	NIOSHTIC	65	0.40/0.40	0.35/0.35	6.50	Quarterly
NTIS	NTIS/NTIS6476	75	0.50/0.50	0.45/0.45	6.50	Biweekly[4]
NATIONAL UNION CATALOG CODES	NUC/CODES	45	0.10/0.10	0.05/0.05	—	—
ORBIT	ORBIT/ORBCHEM/ORBPAT	45	—	—	—	—
PAPER, PRINTING & PACKAGING ABSTRACTS	PIRA	121	0.35/0.55	0.30/0.50	8.50	Biweekly
**PESTDOC	PESTDOC UDB/PESTDOC II UDB/PESTDOC/PEST2					
SUBSCRIBERS		55	0.22/0.22	0.22/0.22	8.00	Irreg.[5]
PESTICIDE DATABANK	PESTMAN	75	0.75/4.50	0.50/4.00	—	—
*PETROLEUM/ENERGY BUSINESS NEWS	P/E NEWS					
SUBSCRIBERS		95	0.25/0.25	0.20/0.20	3.45	Weekly
NONSUBSCRIBERS		95	0.35/0.35	0.30/0.30	4.50	Weekly
PNI	PNI	135	0.75/0.75	0.75/0.75	5.50	Monthly
POWER	POWER	52	0.20/0.20	0.15/0.15	—	—
PRINTS	PRINTS	15	—	—	—	—
RAPRA ABSTRACTS	RAPRA	126	0.40/0.65	0.35/0.50	8.50	Biweekly
RAPRA TRADENAMES	RAPTN	103	0.60/0.60	0.50/0.50	8.50	Biweekly
**RINGDOC	RINGDOC UDB/RINGDOC/ RING 6475					
SUBSCRIBERS		55	0.22/0.22	0.22/0.22	8.00	Monthly[6]
SAE GLOBAL MOBILITY	SAE	100	0.30/0.30	0.25/0.25	6.50	Quarterly
SAFETY SCIENCE ABSTRACTS	SAFETY	125	0.58/0.58	0.53/0.53	8.50	Quarterly
**STANDARD DRUG FILE	SDF	55	0.22/0.22	0.22/0.22	—	—
**STANDARD PESTICIDE FILE	SPF	55	0.22/0.22	0.22/0.22	—	—
STANDARDS SEARCH	STANDARDS	60	0.25/0.25	0.20/0.20	—	—
TROPICAL AGRICULTURE	TROPAG	75	0.30/0.30	0.20/0.20	6.50	Monthly

NC—No charge.

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†Search terms (excluding /RN)—0.33/term; extracted prints—0.03/record selected.

[1] *CAS82 only.*

[2] *UP Update—SDI's also available on UPI update.*

[3] *INSPEC only.*

[4] *NTIS only.*

[5] *PESTDOC UDB and PESTDOC II UDB only.*

[6] *RINGDOC UDB only.*

[7] *VETDOC UDB only.*

[8] *UP Basic Update—SDI's also available on UPEQ, UPA, and UPB updates.*

Table 1. ORBIT Search Service's 1989 price schedule (Continued).

ORBIT Search Service

Database Name	Filename	Connect ($/hr)	Off-Line Prints Prt/Prt (full or tailored) ($)	On-Line Prints Prt/Prt (full or tailored) ($)	SDI Base Charge ($)	Frequency
**TULSA (PETROLEUM ABSTRACTS	TULSA					
HI VOL. MAJ. SUBS.		75	0.25/0.25	0.07/0.12	3.40	Weekly
MAJOR SUBSCRIBERS		75	0.25/0.25	0.12/0.17	3.40	Weekly
MAJ. RET. SER. SUBS.		75	0.30/1.80	0.25/1.50	4.00	Weekly
MINOR SUBSCRIBERS		125	0.50/2.00	0.45/1.65	4.75	Weekly
US CLASSIFICATIONS	USCLASS	60	2.25 per 100 citations or fraction thereof			
US PATENTS (1982-PRESENT)	USPA	100	0.25/0.50	0.15/0.15	6.50	Weekly
			1.00 prt all or tailored		—	—
US PATENTS (1970-1981)	USPB	100	0.25/0.50	0.15/0.15	—	—
			0.50 prt all or tailored		—	—
**VETDOC	VETDOC UDB/VETDOC					
SUBSCRIBERS		55	0.22/0.22	0.22/0.22	8.00	10/yr[7]
WHO'S WHO IN TECHNOLOGY	WHOTECH	115	0.65/0.65	0.50/0.50	—	—
*WORLD PATENTS INDEX &	WPI					
WORLD PATENTS INDEX LATES	WPIL					
SUBSCRIBERS		113	0.45/0.45	0.22/0.22	8.50	Weekly[8]
NONSUBSCRIBERS		178	0.94/0.94	0.45/0.74	8.50	Weekly[8]
	WPIO-ED	38	NC/NC	NC/NC	—	—
WORLD SURFACE COATINGS ABSTRACTS	WSCA	126	0.40/0.55	0.35/0.50	8.50	Monthly

NC—No charge.

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***These databases are available on a restricted basis. contact you local ORBIT Search Service Action Desk for more information.*

†Search terms (excluding /RN)—0.33/term; extracted prints—0.03/record selected.

[1] *CAS82 only.*

[2] *UP Update—SDI's also available on UPI update.*

[3] *INSPEC only.*

[4] *NTIS only.*

[5] *PESTDOC UDB and PESTDOC II UDB only.*

[6] *RINGDOC UDB only.*

[7] *VETDOC UDB only.*

[8] *UP Basic Update—SDI's also available on UPEQ, UPA, and UPB updates.*

Table 1. ORBIT Search Service's 1989 price schedule (Continued).

Accountants—provides access to international literature pertaining to accounting, auditing, taxation, data processing, investments, financial management, financial reporting, and related legal information.

Accountants, prepared by the American Institute of Certified Public Accountants, includes about 14,000 articles per year and covers from 1974 to the present.

CorpTech—available since July 1989, is a complete source of information on the high-technology industry. Areas covered include automation, biotechnology, computers, advanced materials, photonics, and telecommunications.

Prepared by Corporate Technology Information Service, CorpTech also offers explicit corporate profiles.

LABORDOC—indexes the worldwide literature in labor related fields, including industrial relations, economic and social development, management, education and training, law, rural development, social protection, and implications of technical change.

Prepared by the International Labour Organization, the indexed literature covers the period from 1965 to the present and contains approximately 165,000 records.

Chemistry

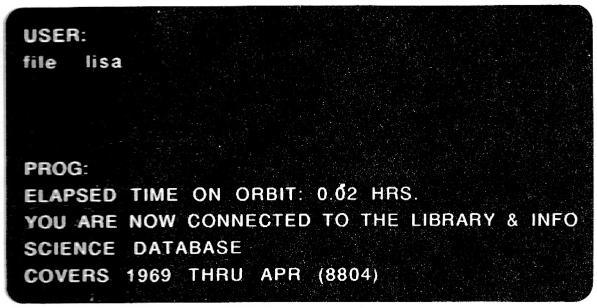
Analytical Abstracts—is an abstract source dealing only with analytical chemistry. Two thousand international primary journals were used in compiling this database. Over 110,000 records are available covering 1980 to date. Delivery of full-text source documents is available through ORBDOC On-line Ordering Service.

Chemical Abstracts—contains worldwide coverage of the chemical sciences literature from over 12,000 journals, patents from 27 countries and 2 industrial property organizations, new books, conference proceedings, and government research reports. Subjects covered are biochemistry, organic chemistry, macromolecular chemistry, applied chemistry, chemical engineering, and physical and analytical chemistry.

Full-text source document delivery is available through ORBDOC On-line Ordering Service.

Chemical Abstracts Service Source Index (Cassi)—covers bibliographic and library holdings information for scientific and technical primary literature relevant to the chemical sciences. The database indexes about 50,000 titles from as far back as 1830.

ORBIT Search Service



```
USER:
file  lisa



PROG:
ELAPSED TIME ON ORBIT: 0.02 HRS.
YOU ARE NOW CONNECTED TO THE LIBRARY & INFO
SCIENCE DATABASE
COVERS 1969 THRU APR (8804)
```

Figure 3. To specify a particular file, the ORBIT user types File and the acronym for the database desired.

Chemical Dictionary—is a companion to the *Chemical Abstracts* databases. Compounds cited in the literature from 1972 to date are contained in these files. Produced by Chemical Abstracts Service, and the American Chemical Society, the database contains over 7 million records.

Chemical Economics Handbook—provides international supply/demand data for the chemical industry. Topics covered are producer/capacity data (by location), future demand projections, trade data (imports/exports), derivatives consumption analyses, manufacturing processes, and price data.

On-line availability is offered only to hard copy subscribers.

Chemical Engineering Abstracts (CEA)—includes theoretical, commercial, and practical material on all aspects of chemical engineering. Articles covering chemically related aspects of mechanical, civil, electrical, and instrumentation engineering are included.

Chemical Industry Notes—covers U.S. and non-U.S. publications to worldwide chemical business news related to production, pricing, sales, facilities, products and processes, corporate and government activities, and people. Produced by Chemical Abstracts Service and the American Chemical Society, there are over 740,000 records ranging from 1974 to the present.

Chemical Reactions Documentation Service (CRDS)—a monthly journal of synthetic methods makes available up-to-date information on new developments in the field of synthetic organic chemistry. On-line access is limited to CRDS subscribers. Contains over 75,000 records from 1944 to the present.

Chemical Safety NewsBase—new from ORBIT, covers a wide range of information on the health and safety effects of hazardous chemicals encountered by employees in industry and laboratories. Topics include safety precautions, chemical hazards, biological hazards, new legislation, plant and laboratory design, waste management, emergency planning, risk analysis, labeling, storage practices, and more.

The Royal Society of Chemistry (RSC) is the producer, and there are over 18,000 records, from 1981 to the present.

ChemQuest—is a comprehensive, automated catalog of commercially available research chemicals and where they can be obtained. The database covers more than 60,000 commercially important compounds including organics, inorganics, biochemicals, dyes, and stains.

Food Science and Technology Abstracts—covers the entire food science and technology fields. Literature related to all human food commodities and food processing are also covered. Source materials were international and included patents, books, standards, conference proceedings, reports, and reviews. Over 1,350 journals from over 74 countries were scanned.

ORBCHEM/ORBPAT—assists the user in crossfile searching of chemical and patents databases. Produced by Pergamon ORBIT InfoLine, these two databases permit the user to SAVE or STORE a search in a low-cost database with all the special qualifiers relating to the chemical and patent areas.

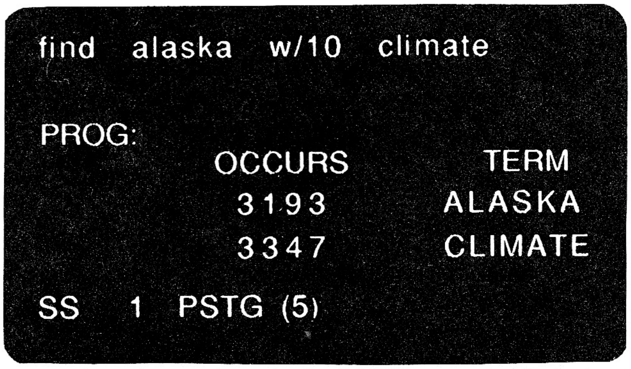
PESTDOC—covers pesticides, herbicides, and plant protection designed for the information requirements of manufacturers of agricultural chemicals. The database covers analysis, biochemistry, chemistry, toxicology, insecticides, herbicides, fungicides, molluscicides, and rodenticides.

Produced by Derwent Publications, Ltd., the file is updated quarterly and contains over 185,000 records.

Pesticide Databank—provides up-to-date information on a wide range of chemical and biological agents used to combat pests in agriculture, horticulture, animal health, industry, and the home. Topics covered are nomenclature, development, properties, uses, toxicology, formulations, and analysis.

The database contains approximately 1,000 records and is produced by The British Crop Protection Council, and CAB International.

PNI (Pharmaceutical News Index)—new from ORBIT, provides current and retrospective news about pharmaceuticals, cosmetics, medical devices, and related health care

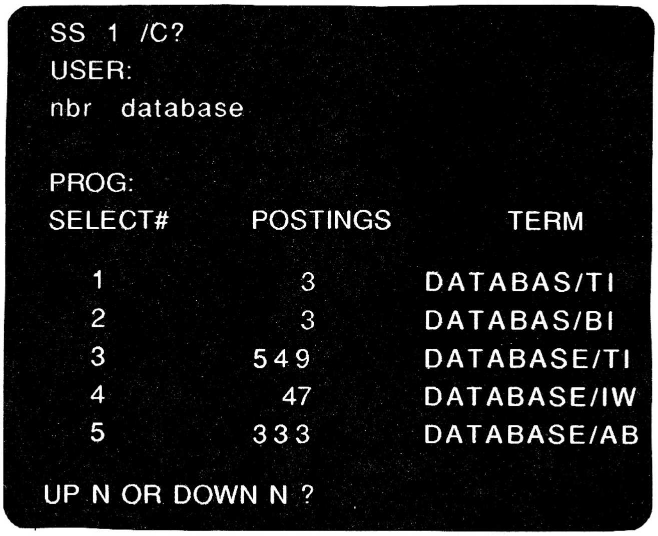


```
find  alaska  w/10  climate

PROG:
            OCCURS          TERM
             3193          ALASKA
             3347          CLIMATE

SS   1  PSTG (5)
```

Figure 4. To begin a search, the ORBIT user types find along with the search terms of interest. Here, we initiated a search in ORBIT's "Cold" database. The system found five hits (called "postings").



```
SS 1 /C?
USER:
nbr  database

PROG:
SELECT#      POSTINGS         TERM
   1            3       DATABAS/TI
   2            3       DATABAS/BI
   3          549       DATABASE/TI
   4           47       DATABASE/IW
   5          333       DATABASE/AB

UP N OR DOWN N ?
```

Figure 5. Use of ORBIT's neighbor command lets the user "preview" search terms.

industries. Pharmaceutical-related issues covered are health legislation and policy making, pharmaceutical research, over-the-counter prescription markets, drug and device recalls, market analysis, biotechnology updates, R&D in progress, veterinary pharmaceuticals, livestock disease news, personnel changes, new drug application (NDA) approvals, acquisitions and mergers, health and beauty aids, advertising campaigns, and joint ventures.

275,000 records make up the database; it is produced by UMI/Data Courier.

RINGDOC—covers pharmaceutical literature designed to meet the information needs of pharmaceutical manufacturers. It addresses all areas of drugs including analysis, biochemistry, chemistry, endocrinology, microbiology, nutrition, pharmacology, side effects, and therapeutics.

Access to this on-line database is restricted to RINGDOC subscribers.

Standard Drug File (SDF)—a companion to the Ringdoc Unified Database, SDF contains a listing of approximately 750 known drugs.

Standard Pesticide File (SPF)—a companion file to the *Pestdoc UDB* file. SPF lists approximately 3,900 known pesticides. It includes the full name and a standard registry name, pesticidal classification of standard activities (if any), chemical substructure terms, chemical ring codes, and other codes. The file contains 3,900 records.

VETDOC—provides access to worldwide journal literature on veterinary applications of drugs, hormones, growth promotants, vaccines, etc. Subjects covered are analysis, biochemistry, chemistry, endocrinology, microbiology, pathology, pharmacology, zoology, and management.

VETDOC is designed to meet information requirements of veterinary pharmaceutical manufacturers. It was compiled from journal articles. On-line access is restricted to VETDOC subscribers.

World Surface Coatings Abstracts—covers all aspects of paints and surface coatings. Source documents include journals, patents, standards, conference proceedings, regulations, books, and U.K. theses. Topics covered are pigments, additives, resins, solvents, coatings (high-solids, water-borne, radiation-curable, etc.), printing inks, electrical, insulation, corrosion resistant and antifouling coatings, testing, industrial hazards, pollution, analysis, regulations, and marketing and statistics.

Approximately 125,000 records are available, from 1976 to the present.

Computer Science

Electronic Publishing Abstracts—covers scientific, technical, and commercial literature in electronic publishing and information technology. Coverage includes input methods, transmission of data, storage and retrieval of text and images, output methods, electronic alternatives both to the publication of printed documents and the methods of printing published documents.

This database is useful for printers, publishers, and those interested in electronic methods of processing information. It contains about 20,000 records, from 1975 to the present.

MICROSEARCH—produced by Information, Inc., provides reviews from microcomputer-related literature and contains information on the availability, applications, compatibility, and comparative evaluations of hardware and software products. The data, from 1982 to the present, includes over 50,000 records.

Directories

American Men & Women of Science—provides a register of active U.S. and Canadian scientists in the physical and biological sciences as well as public health scientists, engineers, mathematicians, statisticians, and computer scientists. There are over 120,000 biographical citations included in this database that is produced by Bowker Electronic Publishing.

Directory of American Research & Technology—provides research and development capabilities of industrial organizations in the U.S. Approximately 12,000 records exist, updated annually by Bowker Electronic Publishing.

National Union Catalog Codes—produced by Pergamon ORBIT InfoLine, includes the names, complete addresses, and National Union Catalog codes for libraries cited in the

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Chemical Abstracts Service Source Index (CASSI) database. There are about 400 records in the database, updated periodically.

ORBIT—is automatically entered when a user accesses the system. Users may request on-line explanations, display the system news, order copies of full-text documents from ORBDOC, send requests for information or documentation, and perform other functions. The file's inexpensive fees make it an attractive feature.

Who's Who in Technology—produced by Research Publications, Inc., contains biographic details and career histories of leaders of American technology. The 35,000 records list name and title, current employer, career history, education, honors and awards, publications and patents, areas of expertise, and memberships in organizations.

Energy and Earth Sciences

APILIT—contains worldwide petroleum literature back to 1964, including petroleum processes, fuels, lubricants, petrochemicals, pipelines, tankers, storage, health, safety and environmental matters, and synthetic fuels. Documents used were trade journals, technical journals, meeting papers, and American Petroleum Institute research reports. It is available on a limited basis to nonsubscribing organizations in countries where at least one subscriber is located.

Electric Power Industry Abstracts—provides access to literature on electric power plants and similar facilities. It includes information on the environmental effects of electric power plants and associated transmission lines, power plant siting methodologies, fuel transportation, storage and use, licensing and permit data, energy resources, monitoring programs, safety and risk management, uranium enrichment, coastal zone management plans, waste disposal facilities, and land-use studies.

Technical reports and studies prepared by the electric utilities and their consultants were some of the sources. The database has approximately 25,000 records, and contains information from 1975 to the present.

Energy Bibliography—covers literature on energy from the Texas A&M Library collection. Topics include production, utilization and conservation, all types of fuels, hydrogen, nuclear energy storage and conversion, energy policy, alternative energy sources, power plants and transmission systems, economic, political, environmental, and statistical aspects of energy-related issues and activities.

Over 12,000 records are in this database, with coverage dating back to the late nineteenth century.

ENERGYLINE—is prepared by Bower Electronic Publishing. It indexes literature on all aspects of energy, including technical, economic, commercial, management, policy, and environmental. It covers all energy sources and uses. Information is from 1971 to the present with about 5,250 citations per year. Full-text document delivery service is available through the ORBDOC On-line Ordering Service from the database supplier.

GEOREF—includes geosciences literature from 3,000 journals, books, conference proceedings, government documents, maps, and theses. Coverage includes geology, economic geology, engineering environment geology, geochemistry, geochronology, geomorphology, igneous and metamorphic petrology, solid earth physics, and stratigraphy.

Approximately 1.5 million records from 1785 to the present. Produced by The American Geological Institute, it is updated monthly.

GeoMechanics Abstracts—is a bibliographic database covering published literature on rock mechanics, soil mechanics, and engineering geology. Topics covered are properties of rock and soils, rock and soil masses, geology and hydrogeology, mining, tunneling, and support, foundation engineering, slope stability, comminution, rock and soil improvement techniques, and site investigation and laboratory and field tests.

Coverage is from 1977 to the present with some pre-1977 material included. The database is updated bimonthly and produced by Rock Mechanics Information Service.

IPABASE—provides information on petroleum and allied literature pertaining to oil field exploration and development, petroleum refining and products, and economics. Technical topics include geology, geophysics, drilling, production, transport, refinery processes, analysis and testing, gas, oil, bitumen, corrosion, safety, pollution, and education and training.

Produced by The Institute of Petroleum; care of John Wiley & Sons Limited, coverage runs from 1985 to the present and includes over 4,000 records.

Engineering and Electronics

*COMPENDEX*PLUS*—combines coverage of the *COMPENDEX* and the *EI Engineering Meetings* databases. It contains both journal articles and individual conference papers without duplicate coverage. The covered subjects include aerospace engineering, civil engineering, bioengineering, chemical engineering, electrical engineering, engineering geology, marine engineering, mining engineering, nuclear technology, and petroleum engineering.

Full-text source documents are available for delivery through ORBDOC On-line Ordering Service. Engineering Information, Inc. is the producer of this database, and it contains over 2.3 million records.

ICONDA—contains bibliographic references to articles published worldwide in construction, civil engineering, architecture, and town planning areas. Topics include struc-

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tural design, materials testing, bridges, tunnels, dams, masonry, concrete, steel, timber, developing countries, building damage and conservation, foundation engineering and geotechnics, building physics, energy conservation, design, project planning and management, building services, and construction equipment.

INSPEC—is composed of worldwide coverage on physics, electrical and electronics engineering, computers and control, and information technology. The source materials used were basically journal articles and conference proceedings; reports, dissertations, and books were also included.

IPABASE—provides information on petroleum and allied literature pertaining to oil field exploration and development, petroleum refining and products, and economics. Topics include geology, geophysics, drilling, production, transport, refinery processes, analysis and testing, gas, oil, bitumen, corrosion, safety, pollution, education, and training.

Produced by The Institute of Petroleum; care of John Wiley & Sons Limited, the information runs from 1985 to the present; IPABASE contains over 4,000 records.

SAE Global Mobility—produced by the Society of Automotive Engineers, Inc., provides access to technical papers presented at Society of Automotive Engineers (SAE) meetings and conferences. Subjects include safety, design, materials, manufacturing, testing, marketing, and fuels.

There are over 26,000 records. Delivery of full-text source documents is available.

Standards Search—covers standards, specifications, test procedures, recommended practices, and proposed standards developed by the Society of Automotive Engineers (SAE) and the American Society for Testing and Materials (ASTM). Topics include automobiles, aircraft, and aerospace materials and other self-propelled vehicles.

Delivery of the full-text source documents is available through ORBDOC On-line Ordering Service. The database contains over 16,000 records and is updated quarterly.

General

Database Index—contains a master index to all ORBIT Search Service databases. It is used as a selection tool to obtain a list of appropriate databases on a certain subject. Updating is done periodically and produced by Pergamon ORBIT InfoLine.

Eric—indexes reports and periodical literature in education and education-related areas: counseling and personnel services; career education; early childhood education; educational management; exceptional children; higher education; information resources; junior colleges; languages and linguistics; reading and communications; rural education; science education; social science education; social studies; tests, measurement, and evaluation; teacher education; and urban education.

Fedreg—the Federal Register, includes rules, proposed rules, public law notices, meetings, hearings, and presidential proclamations. The database includes information from 1977 to the present, with approximately 35,000 citations added per year.

Library and Information Science Abstracts—covers the field of library and information science, library automation, buildings, and equipment. Over 300 periodicals were gathered in over 20 languages. The database is updated monthly, with over 90,000 records.

NTIS—covers U.S. government-sponsored research from over 300 federal agencies. It includes coverage on aeronautics, agriculture, astronomy and astrophysics, biological and medical sciences, chemistry, communications, earth sciences, electronics, energy, engineering, materials, mathematical sciences, military sciences, nuclear science and technology, oceanography, social and behavioral sciences, and space technology.

A large portion of the database contains unpublished material originating outside the U.S. and obtained through international agreements. Foreign material stresses information from Western Europe and Japan and contains about 15,000 new reports yearly. Produced by National Technical Information Service (NTIS) of the U.S. Department of Commerce, its file size has grown to over 1.5 million records.

Health, Safety, and the Environment

Aqualine—covers the world's literature on water and wastewater technology and environmental protection. Subjects include water resources and supplies, water quality, monitoring and analysis of water and wastes, water treatment, underground services and water use, sewage, industrial effluents, and effects on pollution.

Information, from 1960 to the present, includes approximately 120,000 records.

ENVIROLINE—covers air environment, environmental health, land environment, resource management, and water environment. Produced by Bower Electronic Publishing, the database is updated monthly and contains approximately 135,000 records.

Health and Safety Executive—contains bibliographic references from journals, books, pamphlets, government publications, and conference proceedings are contained in this database. Health and Safety Executive produced this database; it has over 100,000 records and is updated monthly.

Safety Science Abstracts—covers the science of safety. It focuses on six major areas: general safety, industrial and

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occupational safety, transportation safety, aviation and aerospace safety, environmental or ecological safety, and medical safety. Produced by Cambridge Scientific Abstracts, the database includes approximately 50,000 records covering from 1981 to the present.

Materials Science

Ceramic Abstracts—is composed of all scientific, engineering, and commercial literature pertaining to ceramics and related materials, including processing and manufacturing. Topics include abrasives, art, design, archaeology, cements and plasters, ceramic-metal systems, glass chemistry, glass properties, glass processing, structural clay products, refractories, whitewares, engineering materials, fiber optics, electronic ceramics, nuclear materials, dielectrics and semiconductors, piezoelectrics and ferroelectrics, magnetic materials, superconductors, production processes and equipment, instruments and test methods, kilns, dryers, furnaces and fuels, raw materials and additives, and physics and chemistry.

Produced by the American Ceramic Society, Inc., this database has approximately 58,000 records from 1980 to the present.

CORROSION—contains information on the effects of over 600 agents on the most widely used metals, plastics, nonmetallics, and rubbers over a temperature range of 40 to 560 degrees Fahrenheit. It is designed to help the engineer select the proper materials for the various components of a system, including processing vessels, tanks, pumps, piping, valves, gaskets, packing, etc. The database contains approximately 2,400 records.

Engineered Materials Abstracts—covers U.S., British, and European patents in the fields of material engineering and related subjects. It includes ceramics, composites, and polymers used in the design, construction, and operation of structures, equipment, and systems.

Materials Information and ASM International are the producers of the database. It contains over 42,000 records covering 1986 to present.

Materials Business File—covers commercial aspects of iron and steel, nonferrous metals and nonmetallic materials, including ceramics, polymers, composites, and plastics. Topics include fuel, energy usage, raw materials, plants, engineering environmental issues, health and safety, product and process development applications, management topics, regulations and marketing economics, statistics resources, world news, and general information.

The database contains over 40,000 records dating from 1985 to the present. Full text source documents are available through ORBDOC On-line Ordering Service from ASM International.

METADEX—covers international literature on metals and alloys concerning processes, properties, materials classes, applications, specific alloy designations, intermetallic compounds, and metallurgical systems.

It covers cross references to translation, and source materials include journal articles, conference papers, technical reports, and books.

Metals Data File—produced by Materials Information and ASM International, provides designation and specification numbers for ferrous and nonferrous metals and alloys, composition forms and applications, manufacturers, element concentrations, and mechanical and physical properties. This database contains over 44,000 records, covering from 1982 to the present.

Paper, Printing, Packaging, & Nonwovens Abstracts—is made up of the world's literature on all types of paper, pulp, nonwovens, printing, and packaging. Coverage includes raw materials and additives, processes, machinery, equipment, pulp and paper mills, printing works, pulping, types of packaging, printing special materials, packaging special products, specialty papers, testing and quality control, disposal and recycling, tamper-resistant packaging, transport of hazardous materials, and business and economics issues.

Produced by the Paper and Board, Printing and Packaging Industries Research Association, it contains information dating from 1975 to the present, and is composed of approximately 150,000 records.

Patents

Chinapats—includes information on all patent applications published under the patent law of the People's Republic of China. The database includes English-language abstracts for all applications filed by Chinese applicants.

CLAIMS, CLAIMS/C, CLAIMS/U—provides access to U.S. patents announced since 1950 in the *U.S. Patent and Trademark Office Official Gazette.* The CLAIMS file series includes bibliographic information. The CLAIMS/U and CLAIMS/C files include the Uniterm chemical indexing in addition to the bibliographic information. The CLAIMS files include all U.S. chemical patents from 1950 forward, and defensive publications from 1963 forward. Design patents issued since 1980 are also covered. The CLAIMS databases contain more than 1.8 million records.

CLAIMS Classification—is an index to the U.S. Patent Office's classification code system containing more than 115,000 subclasses. The database covers from 1790 to the present with biannual updates.

CLAIMS Compounds Registry—includes uniterms for certain compounds which have been referenced in five or more patents contained in the *CLAIMS/U* database. Every record has the IFI compound term number, main compound name, available synonyms, molecular formula, frag-

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ORBIT Search Service

ment codes, and fragment terms. Produced by IFI/Plenum Data Corporation, the file covers from 1950 to present with over 14,000 records.

CLAIMS Reassignments—provides information about U.S. patents that have been reassigned since 1980 or reexamined since 1981. It also contains information about patents that have expired since 1985. Produced by IFI/Plenum Data Corporation, the database contains over 114,000 records, and is updated bimonthly.

INPADOC/INPANEW—offers access to patent documents issued by over 50 national and international patent offices. Searchable items are bibliographic information, including inventor names, applicants, international patent classification codes, and in some cases, titles, complete publication data and application data. The database is produced by International Patent Documentation Centre and is updated weekly.

JAPIO—contains bibliographic data, titles, and abstracts in English for Japanese unexamined patent applications since October 1976. Contains over 2.5 million records ranging from 1976 to the present. Produced by Japan Patent Information Organization, it is updated monthly.

US Classification—makes available all U.S. Classifications, Cross-Reference Classifications, and Unofficial Classifications for all patents issued from 1790 to date. Produced by Derwent, Inc., the database is updated biannually and contains over 5 million records.

US Patents (USPA/USPB)—contains all U.S. patents, continuations, divisionals, and defensive documents from 1970 to the present. Derwent Publications, Ltd. produces this database. The file contains more than 1 million records.

World Patents Index—relates to patent specifications issued by the patent offices of 31 major industrial countries, including European Patent Office and Patent Cooperation Treaty published applications, plus Research Disclosure and International Technology Disclosure. Each patent is indexed from the complete patent specifications, and abstracts are included in both files. Produced by Derwent Publications, Ltd., this database contains over 2.5 million records.

Trademarks and Tradenames

LitAlert—provides the notices of filing and the subsequent actions taken for patent and trademark infringement suits filed in the U.S. District Courts and are reported to the Commission of Patents and Trademarks. The database includes information from 1970 to the present, with a weekly update. Produced by Rapid Patent Service, and Research Publications, Inc., the database has over 12,000 records.

US Trademark Alert—available since June 1989, covers the details of registered and pending Federal Trademarks from the U.S. Patent and Trademark Office. Produced by the The U.S. Patent and Trademark Office, the file will be a watch service and will hold the latest 12 weeks of data.

FUTURE PLANS

Maxwell Online will continue to develop ORBIT Search Service on a focused basis—clusters of databases aimed primarily at researchers in science- and technology-oriented industries, government agencies, and publishers. In addition, it will take advantage of recent ORBIT enhancements and offer a full range of information products—full-text sources, structure searching for chemistry databases, numeric and intermediate alphanumeric databases, as well as bibliographic collections. ☐

Pergamon Financial Data Services (PFDS)

In this report:

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Synopsis

Editor's Note
Since the last version of this report, Pergamon Financial Data Services (PFDS) has increased its menu of databases from 30 to approximately 50. PFDS is now a division of Maxwell Business Information Services Ltd.

Report Highlights
Pergamon Financial Data Services (PFDS) was founded in 1976 as the InfoLine on-line service. InfoLine became part of the Pergamon/British Printing & Communication Corp. group in 1980, assuming its present name in January 1988. PFDS now offers approximately 50 databases, concentrating in the areas of financial and business intelligence information, primarily for the United Kingdom and Europe. PFDS also offers an on-line document ordering service and a Selective Dissemination of Information (SDI) service.

Vendor
Pergamon Financial Data Services
Paulton House
Shepherdess Walk
London N1 FLB, England
(44) 1 71 490 0049

Analysis

Company Background

The InfoLine on-line service, Pergamon Financial Data Services' predecessor, was founded in 1976 by a group of British organizations including The British Library, The Royal Society of Chemistry, The Institute of Electrical Engineers, and the (U.K.) Department of Trade and Industry. In 1980, InfoLine became part of the Pergamon/British Printing & Communication Corp. group, one of the world's largest printing and communications conglomerates.

When Pergamon acquired the information service, InfoLine offered just two databases. Since then, Pergamon has considerably broadened its services. Following Pergamon's acquisition of the Orbit Search Service from SDC in 1986, scientific and patent databases such as *Inpadoc*, *PIRA*, and *RAPRA* were transferred to the Orbit service in the United States.

The former InfoLine service, based on VAX machines in the U.K., was renamed the Pergamon Financial Data Services in January 1988. The new name underlies the company's commitment to developing database products for the financial and business community. At the core of this collection are a number of databases of British company information that were part of the old InfoLine service. These include *Jordans*, *Dun & Bradstreet's Key British Enterprises*, and *Infocheck*.

PFDS is now a division of Maxwell Business Information Services Ltd.

Competitive Position

Pergamon Financial Data Services is strengthening its position in the U.K. business market. The company competes in this market with Profile and Datastar. Giving PFDS an edge, perhaps, is its two-way gateway (which it claims is the first of its type) with the European Space Agency's Information Retrieval Service (ESA-IRS), based in Frasati, Italy. PFDS is also planning to develop an information service aimed at the European business user. This service, the company feels, should help it become a leading information provider to the unified European Market.

Resources and Facilities

Customer Support/Sales and Marketing Services

PFDS offers a range of customer support services, from free on-line time to training courses. These training courses can be either regularly scheduled courses (held throughout Europe) or customized in-house courses. Free seminars on specific databases are also offered.

Update, PFDS' newsletter, describes new databases and features and gives search tips. It is distributed six times per year to all subscribers.

The company maintains a Help Desk that subscribers can call whenever they have a question or need advice on the PFDS system. The Help Desk is located in London.

Networking Services

PFDS is accessible worldwide through all major public networks linked to British Telecom's International Packet Switch Stream (IPSS). In the U.K., PFDS is accessible via the national network and Dialplus.

In North America, PFDS provides customers with a dedicated leased-line telecommunications link available through Telenet and Tymnet. PFDS customers have a choice of 300, 1200, and 2400 bps access via direct dial. An ASCII terminal or microcomputer with the appropriate software can be used to access PFDS.

On-Line Databases

PFDS offers access to approximately 50 databases in the areas of business, finance, news, trademarks, and standards. Brief descriptive summaries of these files follow.

Analysis	provides detailed current and historical information for all U.K. companies quoted on the International (London) stock exchange.
Art Sales Index	a file of works of art sold at auction worldwide, including oil paintings, water colors, drawings, and sculpture.

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Datapro Research Group. Delran NJ 08075 USA

Automotive News	monitors current events within the automotive industry by scanning European daily newspapers and industry journals.
BSI Standardline	covers current British standards, including Codes of Practice, Automobile Series, Marine Series, Aerospace Series, Drafts for Public Comment, and Drafts for Development.
British Trade Marks	contains information on registered U.K. Trade & Service Marks and marks for which application for registration have been made.
Building Societies	provides accounts and general information on all U.K. building societies from 1981/82 to present, taken from the society's published annual returns.
Chemical Age Product File	contains details of all major process plants in the chemical and related industries completed since 1980.
Chemical Business Newsbase	abstracts and brief-related, factual items covering trends and developments in the chemical industry and its end markets.
Chemical Intelligence Service	contains details of worldwide chemical plant information, trade and production statistics for more than 100 organic and inorganic chemicals.
Chemquest	sources of commercially available research chemicals, including catalogs from more than 50 international chemical suppliers.
Comtex	a news database built from articles from major newswire services, with an emphasis on European news.
Current Research in Britain	the national register of research being carried out in universities, polytechnics, colleges, and other institutions within the United Kingdom.
Din	covers German standards.
Duns European Marketing On-line	contains information on over 1.8 million companies in Austria, Belgium, Denmark, France, Greece, Italy, The Netherlands, Portugal, Switzerland, U.K., West Germany, Spain, and Luxembourg.
Duns Marketing Online	Dun & Bradstreet's database of 150,000 U.K. companies, giving sales and marketing profiles, with named contacts.
EMAIL	allows users to send and receive messages to and from PFDS.
ESA/IRS	provides access to 40 databases in key areas of science and technology.
Ecotass	contains news reports relating to the Soviet Union supplied by the TASS news agency.
Europe's Largest Companies	provides detailed information on the top companies in the EEC, Scandanavia, and Switzerland.
Financial Advertising	provides details of display advertising by financial institutions in the U.K. national press and financial journals.
Financial Industry Information Service	detailed coverage of the financial services industry compiled from over 200 financial industry newsletters, newspapers, and journals.
Financial News	provides up-to-date and historical news items relating to financial institutions.
Hoppenstedt	provides detailed descriptions of 41,000 major companies in West Germany and West Berlin.
ICC-Full Text Accounts	entire text and numerical content of the Annual Reports & Accounts published by British companies listed on the International (London) Stock Exchange.
ICC-Gazette	contains reference data on all limited liability companies in the U.K., as well as companies dissolved since 1969.
ICC-Keynote Reports	full-text database containing Market Analysis Reports.
ICC-Stockbroker Reports	full-text database containing reports on the activities and performance of major companies, primarily in the U.K. (70 percent).
ICC-UK Financials	contains up to 10 years of accounts, company profiles, shareholder, and corporate relationship information on over 130,000 companies.
Industrial Market Locations	contains information on over 140,000 U.K. manufacturing and warehousing establishments.
Infocheck	provides full credit ratings and up to four years, financial accounts for over 210,000 U.K. companies.
Infomat International Business News	scans over 500 newspapers and journals worldwide for information on business, economic, and political activity.
Insurance Companies	contains accounts, general information, and returns to the Department of Trade and Industry for leading U.K.-based insurers from 1982/83 to date.
Irish Company Profiles	contains information on 19,000 top companies in the Republic of Ireland.

ITI Computer Sites	database covers 50,000 computer sites worldwide, including 35,000 sites in 14 European countries.
Jordans Shareholder Service	listings of shareholders of U.K.-listed companies and those quoted on the Unlisted Securities market.
Jordanwatch	contains records for all registered U.K. companies held at Companies House and supplemented with information taken daily from the London and Edinburgh Gazettes.
Key British Enterprises	provides essential information on over 25,000 major British companies, determined by turnover, who account for 90 percent of industrial expenditure in the U.K.
Macmillan Directory of Corporate Affiliations	contains information on over 84,000 major multinational companies in over 180 countries.
Management and Marketing Abstracts	scans over 200 European journals, books, government publications, market reports, and statistical sources to monitor trends in management and marketing techniques.
National Computer Index	identifies the use of hardware, software, and peripheral investments at 20,000 U.K. computer sites.
Official Airline Guides	PFDS operates a gateway to the OAG electronic database that contains information on schedules, fares, and availability for over 700 airlines worldwide.
Research Index	provides references to news items and articles of commercial interest taken from over 125 sources including the U.K. national press, trade, economic, and business periodicals.
Sami Shopping Centres	descriptions of over 260,000 retail outlets throughout the U.K.
Scandinavia's Largest Companies	provides information on more than 37,000 companies in Denmark, Norway, and Sweden.
UK Standard Industrial Classification	contains the 1980 SIC codes and main headings defined and maintained by the United Kingdom Central Statistical Office.
US Standard Industrial Classification	U.S. SIC codes corresponding to the 1972 published manual and the 1977 supplement.
Who Owns Whom	developed by Dun & Bradstreet from the *Who Owns Whom* directories, this international file covers the major business locations of the world. Information for each company includes its status as parent or subsidiary and its position within a group.
XFILE	a utility used to identify the most relevant databases for a user's search needs.

PFDS System Capabilities

PFDS' software, which is based on Battelle's BASIS retrieval software, offers users the following capabilities:

GET Commands: enable users to perform statistical analyses of search results on-line and to perform automatic cross-field and cross-file searching. According to PFDS, these commands are unique to its system and provide users with a fast method of performing very sophisticated analyses of patent literature searches.

COPYLINE: PFDS' on-line document ordering service, which enables users to order copies of documents (including patents) located during their search and leave messages for document suppliers. COPYLINE is a menu-driven document ordering system.

PROFILE EDIT: a simple-to-use option that enables users to save on-line searches. Users can also amend those searches that have been saved.

LABEL: a command that enables users to order address labels on-line.

DOWNLOAD: allows PFDS customers to retrieve, at their microcomputers or terminals, information located during an on-line search. This information can be retrieved in a format that is specifically designed for local electronic manipulation.

FLOPPY: lets customers request on-line that a subset of the database that they are searching be written onto a diskette and mailed by PFDS to the user.

TAPE: similar to FLOPPY; a copy of the data is made on magnetic tape and mailed to the customer.

Table 1. PFDS 1990 Price List (August 1990)

		Display / Print / Floppy / Download				
Database/Producer	**Per Hour ($)**	**F1 ($)**	**F2 ($)**	**F3 ($)**	**F4 ($)**	**F5 ($)**
Analysis (Analysis Corp.)	127.50	0.26	1.70	12.75	12.75	1.70
Art Sales Index (Art Sales Index Ltd.)	127.50	0.26	0.43	0.68	0.68	0.51
Automotive News (PRS Consultancy Group)	127.50	0.26	0.34	1.28	1.28	—
British Trade Marks (The UK Patent Office)	127.50	0.26	0.51	0.51	0.51	0.85
BSI Standardline (British Standards Institution)	127.50	0.26	0.34	0.68	0.68	0.68
Chemical Age Project File (PFDS)	127.50	0.26	0.43	1.02	1.36	—
Chemical Business Newsbase (Royal Society of Chemistry)	127.50	0.26	1.28	2.55	2.55	—
Chemical Intelligence Service (Chemical Intelligence Services)	127.50	0.26	1.70	—	—	—
Chemquest (Molecular Design Ltd.)	127.50	0.26	0.34	—	—	—
Comtex (Comtex Scientific Corp.)	127.50	0.26	1.28	—	—	—
Current Research in Britain (The British Library)	127.50	0.26	0.34	0.43	0.60	0.43
Din—German Standards (Deutsches Institut fur Normung e.V.	127.50	0.26	0.34	1.02	1.02	1.02
Duns European Marketing Online (Dun & Bradstreet Ltd.)	127.50	0.26	0.68	1.19	1.53	—
Duns Marketing Online (Dun & Bradstreet Ltd.)	127.50	0.26	0.68	1.19	1.53	—
Ecotass (Tass News Agency)	127.50	0.26	0.85	—	—	—
Europe's Largest Companies (ELC Ltd.)	127.50	0.26	0.68	1.70	2.55	—
Financial Industry Information Service (Bank Marketing Assoc.)	127.50	0.26	0.43	0.68	0.68	—
Hoppenstedt (Hoppenstedt Wirtschaftsdatenbank GmbH)	127.50	0.26	0.77	1.11	3.83	2.98
ICC—Full Text Accounts (ICC Online Ltd.)	127.50	0.26	0.26	0.85	4.68*	—
ICC—Gazette (ICC Online Ltd.)	127.50	0.26	0.68	0.85	1.02	—
ICC—Keynote Reports (KeyNote Publications Ltd.)	127.50	0.26	0.26	0.85	4.68*	—
ICC—Stockbroker Reports (ICC Stockbroker Research Ltd.)	127.50	0.26	0.26	0.85	4.68*	—
ICC—UK Financials (ICC Online Ltd.)	127.50	0.26	1.28	4.25	6.80	4.25
Industrial Market Locations (Industrial Market Locations Ltd.)	127.50	0.26	0.70	1.25	2.50	—
Infocheck (Infocheck Ltd.)	127.50	0.26	3.40	14.45	20.40	—
Infomat International Business News (Infomat Ltd.)	127.50	0.26	0.51	1.02	1.02	1.02
Irish Company Profiles (Eolos)	127.50	0.26	0.34	0.35	0.85	—
ITI Computer Sites (IDG)	127.50	0.26	0.68	1.28	2.04	1.02

* *Per page.*

Table 1. PFDS 1990 Price List (August 1990) (Continued)

Jordans Shareholder Service (Jordan & Sons Ltd.)	127.50	0.26	27.20	27.20	27.20	30.00
Jordanwatch (Jordan & Sons Ltd.)	127.50	0.26	0.68	0.40	20.40	3.40
Key British Enterprises (Dun & Bradstreet Ltd.)	127.50	0.26	0.68	1.11	1.70	2.04
Macmillan Directory of Corporate Affiliations (Macmillans)	127.50	0.26	0.68	1.11	—	—
Management & Marketing Abstracts (Pira)	127.50	0.26	0.43	0.43	0.85	0.85
National Computer Index (National Computing Centre)	127.50	0.26	0.68	1.02	2.04	1.53
Official Airline Guides (Official Airline Guides)	68.00	—	—	—	—	—
Research Index (Business Surveys Ltd.)	127.50	0.26	0.51	0.51	0.51	—
Sami Shopping Centres (Sales & Marketing Information Ltd.)	127.50	0.26	0.68	0.85	1.02	—
Scandinavia's Largest Companies (ELC International Ltd.)	127.50	0.26	0.68	1.70	2.55	—
US Standard Industrial Classification (US Department of Commerce)	68.00	0.26	—	—	—	—
Who Owns Whom (Dun & Bradstreet Ltd.)	127.50	0.26	0.26	1.11	0.85	—
XFILE (PFDS)	68.00	0.26	—	—	—	—

* *Per page.*

Pricing

There are no subscription or monthly minimum charges; users pay only for the time they are on-line. As Table 1 indicates, rates vary depending on the database that is accessed.

Other Services

PFDS Computer-Based Services

PFDS offers a complete line of services to information producers looking for an integrated production system. PFDS can offer customers a choice of output media. Once the information is digitized, PFDS has the software to give producers the following output options: on-line database, magnetic tape/disk, printed publication, and microform.

PFDS also reports that it has extensive experience in:

- File design
- File building and maintenance
- Database/software consultancy
- Automated typesetting

PFDS designs custom-made production systems for information producers who require flexibility for future changes in information organization and output medium. These files are not publicly available on-line through PFDS.

Selective Dissemination of Information (SDI) Service

Users of this service can formulate a search strategy and then specify that the search be run periodically against the updated records of any specified database(s). Through this service, PFDS subscribers are automatically kept up to date in chosen subjects. ■

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Twelve newsletters

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QL Systems Limited

QL Systems Limited was established in 1973 by Queen's University. Its original purpose was to provide an automated system designed to assist in legal research. While the company still specializes in law-related databases, QL also offers energy, engineering, scientific, news, and business files.

In addition to its more than 200 databases, QL Systems Limited provides timesharing data processing and database consulting services; an electronic mail service; *QUICKMAIL*; and a text editing service, QL/Text. The company's retrieval system is accessible throughout Canada, the U.S., Europe, the Middle East, the Far East, and South America.

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COMPANY INFORMATION

QL Systems Ltd.
901 St. Andrews Tower, 275 Sparks Street
Ottawa, Ontario, Canada K1R 7X9 (613) 238-3499

UPDATE: *Since we last reported on QL Systems, a lot has happened. The company has more than doubled its number of available databases, from 100 to more than 220. This variety has come at a price, though; it has raised its access charges from $75 per hour to $95 per hour during prime time. Off-hours access charges also increased, from $30 to $50. In addition, QL Systems moved to a new location in Ottawa.*

Company Background

QL Systems Limited was founded in 1973 to commercialize QUICKLAW, an automated legal research system developed by Queen's University, in concert with IBM. Today, QL Systems vends more than 200 databases, and is Canada's leading on-line vendor of Canadian legal information. The company serves clients in more than 1,600 locations throughout the world.

QUICKSEARCH, QL Systems Limited's main product, is an integrated information system designed especially for document indexing and retrieval. Running on QL Systems Limited's IBM machines, QL/Search and related software support on-line inquiry from databases covering the following areas:

- Asbestos
- Business
- The Canadian North
- Canadian Press Releases
- Communications
- Energy
- Environment
- Film/Video
- Government
- Law
- Mining
- News
- Parliament
- Pollution
- Standards
- Tax Information

Many of QL's databases contain information pertaining only to Canada; however, several databases cover information of international interest as well. Indeed, QL's client base is international, with users in Canada, the United States, Europe, Australia, and New Zealand. In Canada, QL Systems Limited's clients gain access to the system through Canada's Datapac network. To support clients outside Canada, QL Systems Limited's information services are accessible through either the Telenet or Tymnet telecommunications networks in the United States, and through Teleglobe abroad.

In addition to its on-line information retrieval services, QL Systems Limited supports an electronic mail service, *QUICKMAIL*, and a text editing service, *QL/Text*.

QL Systems Limited also provides consulting services to clients interested in creating their own private databases for on-line research. If the resulting database has wide appeal, and the client wishes, QL Systems Limited has a revenue-sharing policy for those who make their database available to other QL Systems Limited users.

For clients interested in maintaining information services on their own computers, QL Systems Limited will either sell or lease its QL/Search, QL/Text, and QL/News systems.

QL Systems Limited is also the Canadian representative for West Publishing Company's WESTLAW Service (Minneapolis), and VU/TEXT Information Service (Philadelphia). Because VU/TEXT uses QL software, QL subscribers can access this information facility using QL/Search commands and features.

Competitive Position

QL Systems Limited is the largest Canadian database vendor, offering the most databases (220) and having the most users (15,000). Actually, its user base is closer to 20,000 since QL provides free passwords to all Canadian

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law school faculty and students. (This policy strikes us as wise, since it is feasible that when these students enter into practice they will become paying subscribers.) Of QL's 220 databases, 30 are French-language files. Coverage is concentrated in the area of Canadian legal information, but QL also offers databases covering the environment, government documents, news, and business.

QL is looking to move beyond law-related databases into other areas. While QL definitely leads the market for Canadian legal information on-line, in other areas it faces fierce competition. For example, Canada Systems Group offers databases covering patents, trademarks, business, and to a lesser extent, law; CISTI (Canadian Online Enquiry Service) offers many sci-tech and engineering files and a few business files; InfoGlobe concentrates on news and business files; Infomart Online provides access to Canadian newspapers on-line and some business databases; and IST-Informatheque specializes in science databases.

RESOURCES AND FACILITIES

Processing Center

QL Systems Limited's information retrieval service is driven by an IBM 4381 computer located in Kingston, Ontario, Canada.

Systems Software

QL Systems Limited engages almost entirely in the provision of data and database management services. End-user involvement in the actual programming of database systems is usually minimal.

QL Systems, however, does offer two database management systems. *QL/Search* is an interactive on-line information retrieval system used for searching full-text, bibliographic, and abstract files. QL/Search uses either full text or selected portions of the texts of documents, such as bibliographic entries and abstracts. QL claims its QL/Search System provides rapid retrieval from a large database, is inexpensive to operate, and is easy to use. Users simply list words in normal English (or French, or other languages) describing the subject of interest. The system employs an automatic statistical weighting to rank retrieved documents in an order that displays those of higher relevance first. This technique allows a greatly simplified query language.

QL/News is, essentially, identical to the QL/Search system described above but is directed to the newspaper and publishing industry.

Customer Support Services

QL Systems Limited offers QUICKSEARCH training sessions in major Canadian centers.

For users without direct access to a terminal, QL Systems Limited refers customers to professional search services that accept research problems over the telephone or in written form. The requests are processed by trained researchers who can often provide immediate answers over the telephone, or who will send hard copy results to the requesting user. QL will also conduct in-house private training sessions on request.

QL provides one free QUICKSEARCH User's Manual and a command reference card called QUICKLIST to assist new users with QUICKSEARCH. A more detailed manual is also available for $75. Lists of publications and manuals are sent to each new user.

Sales and Marketing Services

QL Systems Limited maintains sales offices in Ottawa, Toronto, Vancouver, Calgary, and Halifax. The head office is located in Kingston, Ontario. QL is represented in the U.S. by VU/TEXT of Philadelphia, Pennsylvania, and West Publishing (Westlaw) of St. Paul, Minnesota.

APPLICATION-SPECIFIC SERVICES

Data Communications

QUICKMAIL is an electronic mail service operating over the QL Systems Limited network. Messages can be directed to any user participating in the electronic mail service.

Word Processing/Text Editing

QL/Text is a text editing system suitable for document preparation and general office correspondence. QL/Text is used to prepare manuals, letters, input to document databases, and electronic mail messages.

INDUSTRY-SPECIFIC SERVICES

Publishing

QL/News is a document retrieval system designed to support research and information retrieval for newspaper publishers.

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NETWORKING SERVICES

QL Systems Limited has its own 9600 bps network called QUICKNET. QUICKNET is linked to the Datapac network for use by users within Canada. Subscribers in the United States can access QUICKSEARCH through the GTE Telenet and Tymnet networks. Users located elsewhere can use the Teleglobe network for access. All users are required to have an ASCII terminal with transmission rates of 300, 1200, or 2400 bps.

In major Canadian cities, QL offers a high-speed package, including equipment, modems, and lines operating at 9600 bps. This service is currently available in Halifax, Montreal, Ottawa, Toronto, Winnipeg, Regina, Calgary, Edmonton, Vancouver, Kingston, and Saskatoon. The high-speed package consists of an IBM Personal System/2 Model 30 PC; IBM Proprinter; a 9600 bps dedicated line; associated modems; two free days of training per year; all searches; and all royalty or copyright charges.

Costs for dial-up access in Canada and the United States are $95 per hour (prime time, 7 a.m. to 7 p.m.) and $50 per hour during evening hours and weekends. (For some of the databases, additional royalty or copyright charges may be added.) For the high-speed package, the costs are $150 per hour for prime time and $75 for nonprime time.

ON-LINE DATABASES

QL Systems Limited's main business is providing on-line access to a wide variety of public databases. This access is via the proprietary QL/Search or QL/News software products.

Brief descriptions of QL's databases follow. Detailed information on many of these databases may be found in the On-line Database section (Volume 1, Section OL40) of this publication. QL also offers French equivalents for some of its databases; many are included here.

Energy Conservation and Management

Energy Nova Scotia (ENS)—contains references to literature pertaining to energy topics held by the Nova Scotia Research Foundation, with emphasis on renewables and conservation.

Environement (ENV)—a French-language database referencing French publications concerned with all aspects of the Canadian environment.

IEA Coal Research (COAL)—sponsored by the International Energy Agency (IEA), the database contains references in the form of abstracts covering the coal industry worldwide since 1976.

International Energy Agency Coal Abstracts (COAL)—features more than 122,000 abstracts of relevant articles from technical journals, research reports, monographs, and conference papers covering all aspects of the coal industry.

Engineering and Scientific

Alberta Oil Sands Index (AOSI)—a bibliographic collection of technical literature, patents, government reports, and other materials relating to oil sands (analysis, development, processing and production, and environmental and social issues). The database is produced by the Alberta Oil Sands Information Centre.

Asbestos Information (ASB)—abstracted and key-worded references to literature on all aspects of asbestos mining and processing.

Arctic Science and Technology (AST)—includes citations and abstracts concerning all aspects of the Arctic and other cold regions of the world.

Canadian Environment (CENV)—fully abstracted and key worded references to Canadian water resources literature and related topics.

Delft Hydro (DEL)—abstracts and citations to world literature on hydromechanics and hydraulic engineering.

Heavy Oil/Enhanced Recovery (HERI)—contains more than 3,000 abstracts referencing technical literature, patents, government reports, and other materials on heavy oil and enhanced recovery techniques (analysis, exploration, development, recovery, and upgrading processes). The database is produced by the Alberta Oil Sands Information Centre.

Mineral Processing (MNP)—contains abstracted and key worded references to literature on mineral processing and related topics.

Mining Technology (MNT)—contains references to articles, reports, papers, and books on mining technology and related subjects.

Scott Polar Research Institute Library Catalogue (SPRI)—lists items added to the Scott Polar Research Institute Library in Cambridge, England, since 1985. SPRI contains more than 12,000 bibliographic references to articles and texts on the political, industrial, scientific, and social aspects of the polar regions.

Yukon Bibliography (YKB)—contains abstracts of articles, analytics, monographs, periodicals, theses, published papers, and government and industrial reports covering the period from 1971 to 1975.

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Government

British Columbia Budget, March 19, 1987 (B87)—contains the full text of the British Columbia budget speech delivered by Finance and Corporate Relations Minister Mel Couvelier on March 19, 1987.

Canada Budget (BUD)—selected text of the federal budget brought down by Canada's Finance Minister, with commentary by CCH Canada Limited.

Canada Taxation Publications (CTP)—a global database containing Tax Advance Rulings (TAR), Advance Tax Rulings (ATR), Tax Interpretation Bulletins (TIB), and Tax Information Circulars (TIC).

Canadian Foreign Relations (CFR)—contains reference since 1980 to materials on Canada's postwar foreign relations. QL is authorized to distribute this database only in Canada.

Constitutional Acts of Canada (CAC)—contains 42 Acts, from the Royal Proclamation Act of 1763, up to and including the Canada Act of 1982.

Free Trade Agreement (FTA)—contains the full text of the Canada-U.S. Free Trade Agreement released December 11, 1987, and the Canadian Tariff Schedules.

Hansard Oral Questions (HOQ)—contains the full text of questions and answers from the Question Period of the Canadian Parliament's House of Commons.

Hansard Questions Ecrites (HQE)—the French-language equivalent to the Hansard Written Questions database.

Hansard Questions Orales (HQO)—the French-language equivalent to the Hansard Oral Questions database.

Hansard Written Questions (HWQ)—contains the full text of most written questions and answers posed to the government from the House of Commons. Very long responses are referenced but not included in the database.

Lois Constitutionnelles du Canada (LCC)—the French equivalent of the Constitutional Acts of Canada database.

ON86, ON87, ON88, etc.—these databases contain the full text of Ontario budgets.

Ontario Budget—the full text of the Ontario budget brought down by the treasurer with commentary by CCH Canadian Limited. The database is available free of charge to QL customers.

Ontario Government Information (OGI)—contains comprehensive references to programs and services provided by the Ontario government.

Ontario Securities Commission Comments (OSCC)—contains the full text of all comments made by members of the securities industry in Canada relating to draft regulations and policies proposed by the Commission.

Ontario Securities Commission Decisions (OSCD)—contains the full text of decisions, orders, rulings, press releases, notices, cease trading orders, and other documents published in the weekly Bulletin of the Commission since 1986.

Ontario Securities Commission Regulatory Data Base (OSCR)—contains the full texts of the Ontario Securities Acts and Regulations, plus all OSC Policies and Blanket Rulings, and all National Policies.

Regulations of Ontario (RO)—contains the regulations of Ontario.

Legal

Alberta Judgments (AJ)—contains the full text of all written judgments released by the Alberta Court of Appeal and the Court of Queen's Bench since January 1986, and selected decisions of the Provincial Courts.

Alberta Reports (AR)—contains headnotes of judicial decisions since 35 A.R. 483; part of the National Reporter System (NRS) database.

Arrets du Nouveau-Brunswick (ANB)—the full text of all reasons for judgments released by the Cour d'appel du Nouveau-Brunswick and the Cour du Banc de la Reine since January 1986.

Atlantic Province Judgments (APJ)—a global database containing SCR headnotes since 1876, SCJ full text since 1985; NJ, PEIJ, NSJ, and NBJ full text since 1986.

Atlantic Province Reports (APR)—includes selected decisions, from 1969 to the present, of the courts of New Brunswick, Nova Scotia, Newfoundland, and Prince Edward Island, as well as Supreme Court of Canada decisions on appeals from those courts.

British Columbia Judgments (BCJ)—the full text of judicial decisions rendered by the British Columbia Court of Appeal since January 1986, including both oral and written judgments.

Canadian Judgments (CJ)—a global database containing SCR headnotes since 1876; OR fulltext since 1931; and NJ, PEIJ, NSJ, OJ, OCP, MJ, SJ, AJ, BCJ, NWTJ, and YJ full text since 1986.

Canadian Import Tribunal (CIT)—contains the full text of all decisions of the Canadian Import Tribunal since its inception in 1984, and of its predecessor, the Anti-dumping Tribunal, since its inception in 1979.

Canadian Regulatory Reporter (CRR)—contains bilingual summaries of decisions of provincial and federal Regula-

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tory Boards, including the Canadian Transport Commission, the National Energy Board, and the Canadian Radio-Television and Telecommunications Commission.

Documents, Ordres et Reglements Statutaires (DORS)—French language equivalent of the Statutory Orders and Regulations database.

Dominion Reports Service (DRS)—contains summaries of Canadian Judicial Decisions edited by CCH Canadian Limited.

Dominion Tax Cases (DTC)—summaries of Judicial Decisions current to Report No. 27, copy edited by CCH Canadian Limited.

Exchequer Reports (ECR)—full text of headnotes of the Exchequer Reports from February 1877 to May 1971.

Excise Duty Bulletins (EDB)—contains all regulations and guidelines concerning the policies and applications of excise duties, imposed under the authority of the Excise Act, to products of the beverage and industrial alcohol, tobacco, and brewing industries.

Excise Tax Memorandum (ETM)—sponsored by the Revenue Canada, Customs, and Excise; contains over 50 valid ET Memoranda. These Memoranda contain instructions on the application of the Excise Tax Act. The database is updated when new memoranda or amendments are received. A French language equivalent database is available as Memoranda De L'Accise (MDA).

Federal Court Judgments (FCJ)—contains the full text of all judicial decisions rendered in English by the Federal Court of Canada, both Appeal and Trial divisions, since January 1986.

Federal Court Reports (FCR)—contains the full text of the headnotes from the Federal Court of Canada.

Federal Trial Reports—headnotes of selected judicial decisions from the Trial Division of the Federal Court of Canada.

House of Lords Judgments (HLJ)—the full text of decisions of the House of Lords, London, England, since October 1986.

Institutions Lists (INST)—provided by revenue Canada, Customs & Excise, this database contains the following lists of names of institutions qualifying as exempt or taxable under the Excise Tax Act: Certified Public Institutions, Educational Institutions, Preprinted Certificates of Exemption, Provincial Government Institutions, Registered Institutions.

Judicial Committee Judgments (JCJ)—provides the full text of decisions of the Judicial Committee of the Privy Council, London, England, since February 1987.

Les Rapports de la Cour Federale du Canada (RCF)—the French-language equivalent of the Federal Court Reports database.

Les Rapports de la Cour Suprême du Canada (RCS)—the French-language equivalent of the Supreme Court Reports database.

Lignes Directrices-Accise (LDA)—the French-equivalent of the Excise Duty Bulletins (EDB) database.

Listes des Marchandises-Accise (LMA)—is the French language equivalent to the Commodity Lists Excise (CLE) database.

Manitoba Judgments (MJ)—contains the full text of all written judgments released by the Manitoba Court of Appeal and the Court of Queen's Bench since January 1986.

Maritime Law Book Key Number Data Base (MLB)—a breakdown of the key numbers and the corresponding titles and subheadings used by Maritime Law Book Ltd. editors in indexing the judicial and administrative board decisions reported in all of their law report series.

Memoranda De L'Accise (MDA)—is the French language equivalent to the Excise Tax Memorandum (ETM) database.

Manitoba Reports (MANR)—contains headnotes of judicial decisions since 14 Man. R. (2d) 368; part of the National Reporter System (NRS) database.

National Reporter (NR)—contains headnotes of judicial decisions since 41 N.R. 271; part of the National Reporter System (NRS) database.

National Reporter System (NRS)—contains headnotes of all judicial decisions published by Maritime Law Book Limited, commencing from the following pages: 98 A.P.R. 352, 35 A.R. 483, 14 Man. R. (2d) 368, 39 N.B.R. (2d) 631, 36 Nfld. & P.E.I.R. 115, 41 N.R. 271, 50 N.S.R. (2d) 352, and 15 Sask. R. 91.

New Brunswick Judgments (NBJ)—the full text of judicial decisions rendered by the Court of Appeals of New Brunswick.

New Brunswick Reports (NBR)—contains headnotes of judicial decisions since 39 N.B.R. (2d) 631; part of the NRS (National Reporter System) database.

Newfoundland Judgments (NJ)—the full text of judicial decisions rendered by the Supreme Court of Newfoundland: Court of Appeal, Trial Division, and Unified Family Court.

Newfoundland and Prince Edward Island Reports (NFL)—contains headnotes of judicial decisions since 36 Nfld. & P.E.I.R. 115; part of the National Reporter System (NRS) database.

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Nomination De L'Agent-Accise (NAA)—is the French-language equivalent to the Excise Appointment of Agents (AAE) database.

Northwest Territories Judgments (NWTJ)—contains the full text of all written judgments released by the Northwest Territories Court of Appeal, the Northwest Territories Supreme Court, and the Territorial Courts since January 1986.

Nova Scotia Judgments (NSJ)—the full text of judicial decisions rendered by the Supreme Court of Nova Scotia: Appeal Division and Trial Division.

Nova Scotia Reports (NSR)—contains headnotes of judicial decisions since 50 N.S.R. (2d) 352.

Ontario Appeal Cases (OAC)—part of the National Reporter System (NRS) database. Contains headnotes of judicial decisions.

Ontario Civil Procedure (OCP)—contains the text of judgments, endorsements, and summaries of decisions and rulings concerning the new Ontario Rules of Civil Procedure that came into force on January 1, 1985.

Ontario Judgments—the full text of judicial decisions rendered by the Ontario courts, including the Ontario Court of Appeal, the High Court of Justice, and the Divisional Court of the High Court of Justice.

Ontario Reports Plus (ORP)—includes both headnotes and the full text of judgments of all civil and criminal cases from Ontario courts published in the *Ontario Reports* by the Law Society of Upper Canada, notations of all appeals taken from those decisions to the Supreme Court of Canada, and all Ontario Civil Procedure cases decided by the courts of Ontario under the new Rules of Civil Procedure that became effective January 1, 1985.

Prince Edward Island Judgments (PEIJ)—the full text of judicial decisions rendered by the Supreme Court of Prince Edward Island: Appeal Division, General Division, and Family Division.

Quebec Appeal Cases (QAC)—contains the headnotes of all decisions published in the Quebec Appeal Cases by Maritime Law Book Limited of Fredricton, New Brunswick.

Recueil de Jurisprudence Administrative (RJA)—the French version of the Canadian Regulatory Reporter (CRR) database.

Revised Statutes of Canada (RSC)—contains the Office Consolidation prepared by the Department of Justice.

Ruling Information System—Excise (RISE)—a database of Canadian excise tax rulings from the Excise Tax Branch, Revenue Canada.

Saskatchewan Judgments (SJ)—the full text of judicial decisions rendered by the Courts of Saskatchewan, beginning with the decisions of the Saskatchewan Court of Appeal and the Court of Queen's Bench.

Saskatchewan Reports (SASK)—contains headnotes of judicial decisions since 15 Sask. R. 91; part of the National Reporter System (NRS) database.

Small Claims Court Judgments (SMCJ)—contains the full text of decisions from small claims courts across Canada; the Ontario Provincial Court (Civil Decision), the Alberta Provincial Court (Small Claims Division), and others as available.

Statutes of Alberta (SA)—contains the text of the Revised Statutes of Alberta in force July 1, 1984.

Statutes of British Columbia (SBC)—contains an Office Consolidation of the Statutes of British Columbia.

Statutes of Manitoba (SM)—a consolidation of the statutes of Manitoba effective from late 1979.

Statutes of New Brunswick (SNB)—contains an office consolidation of the Statutes of New Brunswick.

Statutes of Ontario (SO)—contains an office consolidation of the Statutes of Ontario.

Les Statutes Revises du Canada (SRC)—the French-language equivalent to the Revised Statutes of Canada database.

Statutes of Saskatchewan (SS)—an office consolidation prepared by the Saskatchewan Legislative Counsel Office; complete to April 30, 1982.

Statutory Orders and Regulations (SOR)—contains selected regulations prepared by the Department of Justice.

Supreme Court of Canada (SCC)—contains the full texts of all judgments rendered by the Supreme Court of Canada since January 1985. Each judgment includes a headnote containing subject key words and a summary of the decision prepared by the Law Editors at the Supreme Court of Canada.

Supreme Court Reports (SCR)—contains the full text of the headnotes from the Canadian Supreme Court Reports.

Systèeme de Renseignements sur les Decisions de L'Accise (SRDA)—the French equivalent of the Ruling Information System-Excise database.

Tariff Board Reports (TBR)—contains the full text of all headnotes and judgments published in the Tariff Board Reports since 1937.

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Tax Advance Rulings (TAR)—contains income tax rulings published by the Deputy Minister of National Revenue for taxation in Canada.

Tax Court of Canada Judgments (TCJ)—contains the full text of all decisions released by the Tax Court of Canada since January 1986.

Tax Information Circulars (TIC)—features procedural matters relating to the Income Tax Act, contribution provisions of the Canada Pension Plan, and announcements of changes in organization, personnel, operating programs, and other administrative developments within the department.

Tax Interpretation Bulletins (TIB)—contains Revenue Canada Taxation's interpretations of the laws it administers.

Tax Reform Data Base (TR1)—contains the full text of the Tax Reform White Paper released June 18, 1987; the Report on Tax Reform released November 16, 1987; the Government Response to the Commons Committee Report Plus Ways & Means Motions released December 16, 1987.

Tax Reform White Paper—Commentaries (TR2)—contains full text commentaries on the Tax Reform paper provided by a number of sources including Coopers & Lybrand.

Trade Marks Opposition Board Judgments (TMOB)—contains the full text of all decisions released since January 1986 by the Registrar of Trade Marks (Canada), Hearing Officers designated by the Registrar, and members of the Trade Marks Opposition Board.

Western Provinces Judgments (WPJ)—a global database containing SCR headnotes since 1876; SCJ fulltext since 1985; MJ, AJ, BCJ, NWTJ, and YJ full text since 1986.

Western Weekly Reports (WWR)—contains the full text of headnotes taken from the Western Weekly Reports starting in 1968.

Yukon Judgments (YJ)—the full text of judicial decisions released by the Yukon Territory Court of Appeal since January 1986, including both oral and written judgments.

Yukon Reports (YR)—includes the headnotes of all decisions published in the Yukon Reports by Maritime Law Book Limited of Fredericton, New Brunswick.

Miscellaneous

Appointment of Agents-Excise (AAE)—contains the names of agents who have been engaged by a company to purchase conditionally exempt goods on its behalf. Also included is the name of the project for which the goods have been purchased, the date the project starts, and, in most cases, the completion date.

Boreal Northern Titles (BNT)—developed by the Boreal Institute for Northern Studies, covering the circumpolar north, Canadian peoples, mid-Canada development, and other related topics. Citations are updated monthly.

Business Information Wire (BIW)—includes the text of the Canadian Press Business Information Wire, from September 4, 1984 to 3 a.m. EST today.

Canada News-Wire (CNW)—the full text of all English-language news releases that have been distributed via the Canada News-Wire Service.

Canadian Business & Current Affairs (CBCA)—a global database containing *Canadian Business Index*, *Canadian Foreign Relations*, *Canadian Magazine Index*, and *Canadian News Index*.

Canadian Business Index (CBI)—an index of some 150 Canadian business publications offering access to information useful in many areas, including advertising, agriculture, architecture, communications, environment, insurance, publishing, and transportation.

Canadian Journalism Database (CJD)—a bibliography of materials on journalism, research papers, and press council decisions; a professional directory of journalists; media news; and a job bank.

Canadian Magazine Index (CMI)—a quick reference to Canadian special interest magazines and periodicals. The database also includes 15 U.S. periodicals.

Canadian News Index (CNI)—an index to major stories published in the *Montreal Star*, *Toronto Globe and Mail*, *Toronto Star*, *Vancouver Sun*, *Winnipeg Free Press*, *Calgary Herald*, and *Halifax Chronicle-Herald*.

Canadian Press Newstex (CPN)—provides full-text CP News Wire Service stories. The database is updated daily and contains over 700,000 news stories from January 1, 1981 onward.

Canadian Press QUICK (CPQ)—contains the current day's stories from the Canadian Press wire service. The database is updated every three hours between 8 a.m. and 11 p.m. (EDT) daily.

Certified Products Database—up-to-date information on more than 30,000 product lines certified by the Canadian Standards Association.

Commodity Lists-Excise (CLE)—contains lists of goods qualifying as exempt or taxable under the Excise Tax Act. The list includes health goods, construction equipment, municipalities, farm dealership arrangements, processing

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▷ materials, farm goods, construction materials, and equipment for buildings, and gasoline-powered chain saws.

Film-Video Canadiana (FVC)—a bibliographic guide to more than 4,000 Canadian films and videos produced in English and French since 1969 by both the public and private sectors.

Film-Video Producers and Distributors (FVPD)—a directory of names and addresses of all English and French films and videos produced in both languages since 1969 by both the public and private sectors.

International Bibliography of the Social Sciences (IBSS)—an index of the items published in the annual International Bibliography of Economics, and the International Bibliography of Sociology. This includes articles and books concerning economics; sociology; and related industrial, political, and other subjects.

QL Amortization Schedule (MORT)—is a means of using QL's computer facilities to produce an amortization schedule.

QL Calculator (CALC)—is a free service that permits the user to perform simple arithmetic.

QUICKMAIL Directory (QLM)—a directory of all users of QL's electronic mail service. The directory may be searched by name, organization, city, province or state, country, or box number.

QUICKSEARCH Data Base Description Manual (QLDM)—contains full text descriptions of the databases that form part of the QUICKSEARCH on-line retrieval system.

Suicide Information and Education (SIEC)—references to printed English literature and audiovisual materials on suicide.

Yukon Bibliography (YKB)—developed by the Boreal Institute for Northern Studies, contains citations and abstracts that pertain to all aspects of the Yukon.

The Whig Standard (WHIG)—a full text database of news stories from Canada's oldest newspaper, *The Whig-Standard* of Kingston, Ontario.

OTHER SERVICES

QL Systems Limited offers consulting, systems analysis, and programming to clients wishing to use computers to handle textual information. If required, QL Systems Limited will operate the resulting database within its retrieval services network.

QL Systems Limited also seeks contracts for the conversion of documents into machine-readable form. Special emphasis is on conversion of information into forms suitable for use in automated retrieval systems.

QL Systems Limited makes its QL/Search, QL/Text, and QL/News software available for sale or lease. The company will also sell or lease its more than 125 other programs designed for such tasks as computerized text editing.

QL Systems Limited is the Canadian representative for the WESTLAW Information Service based in St. Paul, and the VU/TEXT Information Service based in Philadelphia. WESTLAW, published by West Publishing Company, is a legal information retrieval service, containing over 1,000 databases on U.S. law. VU/TEXT, the information service operated by Knight-Ridder Newspapers, Inc., offers the text of more than 40 U.S. newspaper databases including the following: the *Philadelphia Inquirer* (January 1981 to present), the *Philadelphia Daily News* (January 1978 to present), the *Lexington* (KY) *Herald-Leader* (January 1983 to present), the *Washington Post* (April 1983 to present), and the *Academic American Encyclopedia* (copyright 1982). Because VU/TEXT uses QL software, many of the same QUICKSEARCH commands and features can be used to access the databases of the two services.

FUTURE PLANS

According to the vendor, QL Systems Limited will continue to add new databases at a rate of one per month and enhance the current system. QL Systems will increase the number of databases in the areas of mining, business, law, news, and the arts. ☐

Questel, Inc.

Questel, Inc. is a U.S. subsidiary of Telesystemes-Questel, the official French on-line vendor. Questel offers more than 60 databases on topics ranging from adhesives to transportation, including business, science, technology, medicine, arts and humanities, social sciences, and intellectual property; many of its files are international. Its strengths are in chemical, patent, and trademark information.

For international users, Questel offers a software package, MicroQuestel, that enables subscribers to search (via prompts and menus) in either English or French. More than 5,000 organizations use Questel's databases.

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On-Line Databases 102
Pricing 105

COMPANY INFORMATION

Questel, Inc.
5201 Leesburg Pike, Suite 603
Falls Church, Virginia 22041 (703) 845-1133,
(800) 424-9600

UPDATE: *Questel has added several files that strengthen its position as a leading vendor of patent, chemical, and sci-tech files. In addition, it added a new service, Markush DARC—a graphical, chemical database system, expressly designed for retrieving chemical structures from patent documents. Since our last report, Questel has raised its prices only moderately.*

Company Background

Questel, Inc. is the U.S. subsidiary of Telesystemes-Questel, France's leading on-line vendor. More than 1,000 professionals worldwide work for Telesystemes, which was founded in 1969. Questel offers international databases covering patents, chemistry, trademarks, medicine, science and technology, business, news, law, and the social sciences. A fair number of its files are in French, and several are unique to Questel.

Questel serves its worldwide customer base from offices in Europe, the U.S., Canada, and Japan. It provides comprehensive training programs, user manuals for both the system and the databases, and newsletters to keep its customers abreast of new developments.

Questel also offers the DARC system for accessing chemical information, available either on-line or as an in-house system. Now loaded on DARC are five structure files that contain more than 9 million chemical compounds. Questel also recently added a graphic chemical database system for inputting, storing, and retrieving compounds included in the definition of generic structure representations commonly used in patents.

Competitive Position

While its parent company is one of Europe's leading database vendors, Questel must be considered a relatively minor player in the U.S. database industry. In Europe, Telesystemes-Questel competes with DIMDI, ESA-IRS, Pergamon, and Data-Star. In the U.S., Questel's primary competitors are BRS and ORBIT (now both Maxwell companies) and DIALOG.

Questel is extending its reach through participation in gateways such as iNet, EasyNet, and Japan's MASIS Center (which also offers access to the DIALOG and Utlas systems). It continues to add new databases that boost its already strong list of patent and sci-tech files. Recent additions include a database on trademarks registered in the Federal Republic of Germany, and ACIDOC, which covers acid rain. Questel is perhaps best known for its DARC retrieval software for searching chemical structures.

RESOURCES AND FACILITIES

Customer Support/Sales and Marketing Services

Questel maintains marketing offices in 12 countries (see Table 1). In terms of training, Questel offers basic workshops that describe what the company's databases cover, as well as give users an idea of the capabilities of Questel's search language. Advanced courses are also offered, and on-site training is available through special arrangement.

The company also publishes two newsletters: *Questel Actualities* and the *Questel-a-Gram*. *Questel Actualities* is published six times a year in Europe. The *Questel-a-Gram* is published in the U.S. as an international newsletter. The newsletters describe the service's new database offerings; discuss search strategies; and cover Questel's activities, such as its participation at trade shows.

Questel also maintains two permanent Help Desks to assist its customers. In the U.S., the number is (800) 424-9600. In Europe, call 33-1-45826464.

▷

MICROCOMPUTER/SOFTWARE SERVICES

DARC

DARC is a chemical structure and substructure searching language that allows the searcher to use alphanumeric (text) or graphic query input. The DARC system features more than 9 million structures in five databases, four of which are based on the *Chemical Abstracts Registry.* The fifth is a collection of structures and their recorded mass spectra in a database developed by the National Institute of Standards and Technology (NIST).

Searching is done on structures, substructures, and generic formulae. To query DARC via graphic input, the user enters a drawing of the molecule in question by using a mouse or a light pen. DARC is available for in-house applications as well as on-line. In-house applications are available to companies that want to build and search private databases.

Markush DARC, the world's first graphical chemical database for inputting and retrieving generic structures such as those described in patent literature, is another new addition.

Questel Plus

Questel Plus, the textual or bibliographic searching software used in Questel, is an enhanced version of the original Questel software. New features provided include use of a variety of proximity operators, selective extraction and reuse of extracted terms for searching in similar or different files, expanded processing power, and extraction and statistical ranking of data elements.

NETWORKING SERVICES

Questel supplies its users with the necessary communications link for on-line usage. In the U.S., access is through Infonet or Tymnet; in Europe, through Euronet, PSS, Datex-P, and Telepac. French Minitel users can access Questel through the network. Telecommunications charges are $12 per hour.

ON-LINE DATABASES

Questel provides access to more than 60 databases covering a wide range of subjects, including patents, chemistry, the social sciences and humanities, the applied sciences and technology, and the life sciences.

Questel offers options to help users effectively search the proper database and to get the information they require. A Selective Dissemination of Information (SDI) service is available, as is the capability to save search strategies. Users can reexecute saved searches at their discretion, order off-line printouts, and download information.

AUSTRIA
MANZ DATENBANKEN
A-1040
WIEN
Tel. 43 (0222)
57.36.20

BELGIUM
CNDST
Bibliothèque Royale
Boulevard de
l'Empereur
B-1000 BRUXELLES
Tel. 01/513.61.80
Ext. 554

BRAZIL
TELESYSTEMES DO
BRASIL
Avenida R. Branco, 31
20090 RIO
DE JANEIRO
Tel. 55 (21) 253.4380

CANADA
IST INFORMATEQUE
1611 Boul. Cremazie
H2M 2P2 MONTREAL
Tel. 1 (514) 383.1611

GREECE
INTERSYS
7 Dion, Aeropagitou Str.
ATHENS 403
Tel. 30 (1)
92 36970

JAPAN
MARUZEN CO. LTD
MASIS CENTER
P.O. Box 5335
TOKYO 103
Te. 81 (3) 271 6068
and 272 7211

MEXICO
SECOBI-CONACYT
Circuito Cultural
Centro Cultural
Universitario
Cuidad Universitaria
04515 MEXICO D.F.
Tel. 52 (5) 655.6366
and 655 7488
Ext. 2070 2071

THE NETHERLANDS
COBIDOC
St. Antoniesbree-
straat, 16
2nd Floor
PTT, Bijkantoor
1011 HB AMSTERDAM
Tel. 31 (20) 22.39.55

PORTUGAL
SOCIEDADE
PORTUGUESA DE
COMPUTADORES EN
TEMPO DIVIDIDO
(TIMESHARING)
Avenida 5 de Outubro,
95
3e DTo
1000 Lisboa
Tel. 351 (19)
76.95.51

SWEDEN
STUDSVIK
Biblioteket
S-611 82 NYKOPING
Tel. 46 (155) 800.000

UNITED STATES
QUESTEL, Inc.
5201 Leesburg Pike
Suite 603
Falls Church, VA
22041
Tel. 1 (703) 845-1133

UNITED KINGDOM
Fraser Williams
(Scientific Systems)
Ltd.
London House
London Road South
Poynton, Cheshire
SK12 IYP
Great Britain
Tel. 0625-876711

Table 1. Questel's worldwide offices.

Detailed information on many of these databases may be found in the On-line Databases section (OL40) of this publication. Brief descriptions of their coverage follow.

ACIDOC (Acid Rain)—a bilingual bibliography covering all aspects of acid rain. The database features information from monographs, periodicals, conference papers, theses, reports, and other publications.

ADHEMIX (Adhesives and Glues)—structural glues, sold in France, that are used for joining materials.

AECO (Agora-Economy)—provides full coverage of French and international economic and financial affairs.

AGRA (French and International News)—provides condensed or expanded information detailing French and international news.

BODACC (French Companies)—new entries from official French companies and the trade register called the *Bulletin Officiel des Annonces Civiles et Commerciales.*

CAS (Chemistry and Chemical Engineering)—more than 8,000,000 bibliographic citations covering molecular

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chemistry, macromolecular chemistry, applied chemistry and chemical engineering, physical and analytical chemistry, and biochemistry.

CIM (Hydraulic Binders and Cements)—hydraulic bindings, cements, limes, plasters, and related fields.

CIS (Occupational Safety and Health)—worldwide literature on occupational safety and health, including occupational medicine and physiology, environmental hygiene, management techniques, training and education, safety engineering, and accident prevention.

DAUGAZ (Natural Gas)—gas research, production, transport, storage, and distribution; use of the products; renewable energy; sciences; and techniques of the gas industry.

DBFM (Dun & Bradstreet France Marketing)—information on nearly 170,000 French companies spanning all sectors including industry, trading, building, construction, public works, services, banks, and insurance.

DEFOTEL (Company Information)—provides information on 1,500 French and foreign firms quoted on the French Stock Exchange. The database includes financial and stock market information, administrative information, and industrial and commercial information.

ECOMINE (Mining Literature)—covers the field of mining economics.

ECLATX (Patents)—the full text of the internal classification scheme of the European Patent Office (EPO), built up according to the hierarchical structure of the International Patent Classification (IPC).

EDF-DOC (Electricity Production and Distribution)—covers energy sources, including the production, transmission, and distribution of electricity; rural, domestic, and industrial applications of electricity; and environmental problems—industrial waste and pollution.

EDOC (Patent Documents)—published applications and delivered patents, forming the search documentation of the European Patent Office.

EECDNG (Dangerous Chemicals)—consolidated data on dangerous chemicals and the chemical industry.

EPAT (European Patent Registry)—all European patents, published applications, and EURO-PCT since June 1978.

ESSOR (Industrial Companies in France)—a directory of 148,000 French industrial companies identifying executives and activities.

FMARK (Trademarks filed in France)—bibliographic, administrative, and legal information on French trademarks.

FPAT (French Patent Registry)—patents applied for and published in France since 1969.

FRANCIS (Human and Social Sciences)—the humanities, including philosophy, art and architecture, and linguistics, as well as coverage of the social sciences, including education, sociology, ethnology, and employment and training.

GEOBANQUE (French Underground Works)—references to French underground works: wells, borings, quarries, and mines.

IALINE (Agriculture and Food Industry)—agriculture and the food industry, including composition, quality and properties of raw materials, ingredients and manufactured products, processing and engineering methods, quality control, regulations, consumption, and trade.

ICCF (Canadian Company Information)—directory and financial information for up to the last five years on major Canadian corporations.

ICONOS (French Photographic Locations)—provides information on original photographs from 1839 on; details on professional photographers; and public photo libraries.

JANSSEN (Chemical Catalog)—a catalog of chemical products searchable using DARC and Questel.

JURINPI (Jurisprudence Relative to French Patents and Trademarks)—published or unpublished, French or European (EPO) jurisprudence concerning a patent or trademark.

LOGOS (Political News)—French politics, society, and economy.

MEDLINE (Bibliographic Medical Database)—produced by the National Library of Medicine and covering all areas of medicine: biochemistry, biology, pharmacology, clinical medicine, veterinary medicine, dentistry, etc.

MEETING (Announcements)—announcements of congresses, conferences, meetings, workshops, exhibitions, and fairs organized around the world, in all scientific and technical fields, the social sciences, and the humanities.

THE MERCK INDEX (Pharmaceuticals)—bibliographic, chemical, physical, and toxicity data and text on specific substances as well as chemically and biomedically related substances.

NORIANE (Standards)—French and ISO standards and draft standards in all fields, including metallurgy, mechanics, chemistry, textiles, construction, transportation, energy, information science, electronics, and the food industry.

ORIADOC (French Information Sources)—a "catalog" of all the public and private French documentation and information centers.

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DATABASE	CONNECT HOUR ($)	ON-LINE DISPLAY ($)	OFF-LINE PRINT ($)
ADHEMIX	75	0.75	0.75
AECO	85	0.25	0.30
AGRA	85	0.25	0.30
BIBLAT	65	0.25	0.25
BIOETHICS	35	0.10	0.16
BOAMP	68	0.35	0.40
BODACC	95	0.30	0.30
CAS	94	0.35	0.47
CIM	60	0.30	0.30
CIS-ILO	117	0.35	0.40
CUADRA	60	0.60	0.70
DAUGAZ	92	0.30	0.30
DBFM	92	0.50	1.30
DEFOTEL	80	1.30	8.00
ECLATX	50	0.00	NA
ECOMINE	93	0.25	0.25
ECOTHEK	60	0.30	0.30
EDF-DOC	70	0.30	0.30
EDOC	150	0.15	0.15
EPAT (INPI-2)	95	0.35	0.40
ESSOR	77	0.55	0.55
FPAT (INPI-1)	95	0.35	0.40
FRCIS-H	70	0.40	0.42
FRCIS-S	70	0.40	0.42
GEOBANQUE	70	0.25	0.30
GRAPPE	75	0.30	0.30
IALINE	70	0.40	0.40
ICONOS	77	0.25	0.40
IFP-TH	70	0.18	0.28
INFOGRAL	93	0.35	0.55
INPI-MARQUES	95	0.35	0.40
INPI-4F	50	0.00	NA
JANSSEN	70	0.30	0.35
LABINFO	90	0.40	0.55
LOGOS	80	0.25	0.30
MEDLINE	35	0.10	0.16
MEETING AGENDA	75	0.25	0.30
MERCK	70	0.50	0.55
NORIANE	70	0.35	0.37
ORIADOC	55	0.25	0.30
PASCAL	70	0.43	0.43
QUESTA 6, 7, 8	70	0.25	0.30
QUESTEL (Home File)*	25	NA	NA
TMINT	125	0.35	0.40
WPI/L (Subscriber)	108	0.10	0.34
WPI/L (Nonsubscriber)	168	*(1)* 0.32 *(2)* 0.18	0.68
ZCAS	30	0.00	NA
ZPASCAL	30	0.00	NA
ZWPI	30	0.00	NA

**All users are automatically connected to Questel (home file) at the beginning of the session. Billing for Questel (home file) ends once another database is selected.*
NA—Not applicable.
(1) Billed when abstract is displayed (ABST, MAX, and tailored formats including abstracts).
(2) Billed when abstracts are not displayed (FULL, STDR, excluding abstract). TEST and CODE formats are free of charge.

Table 2. On-line charges per connect hour for accessing Questel's databases (as of January 1989).

PASCAL (Sci-Tech File)—a unique, multidisciplinary database covering the physical sciences, earth sciences, life sciences, and engineering sciences.

PHARM (Pharmsearch)—U.S., EPO, and French patents in the pharmaceutical field since 1987.

Questa 6, Questa 7, Questa 8, and Questa 9 (Parliamentary Questions)—written and oral questions addressed to cabinet ministers by members of the French Parliament relating to legal, social, economic, and political problems in France.

DARC System

	Price ($)
Connect Hour	55
Substructure Search Fee	
EURECAS	90
POLYCAS	90
UPCAS	28
MINICAS	11
SPECTRA	15
Exact Match or Family Search	15
Compound Number (RN or CN) Search	2
Recall of Saved Answer File	7
On-line Display Fees	
Graphic Displays	
Test Format	Free
Standard (STDR) Format	0.35 + 0.11 per CAN* displayed
Ref Format	0.70
Bib Format	0.35
ML Format	0.35
ML2 Format	0.70
Text Displays	
Compound Number Only (LI CN)	0.08
Compound Number, Nomenclature, and Molecular Formula (LI ML)	0.35
Compound Number, Nomenclature, Molecular Formula, and CAS Accession Numbers	0.35 + 0.11 per CAN* displayed
Off-line Print Fees	
Compound Number, Structure, and Nomenclature	
1 to 100	0.47
101-	0.42

**CAN = Chemical Abstracts Accession Number.*

Table 3. Fee schedule for access to the DARC system.

▷ *TELEDOC (Telecommunications and Related Fields)*—telecommunications; electronics; and related fields, such as electrical engineering, automation, acoustics, optics, physics, mathematics, and computer science.

TMGER (German Trademarks)—all verbal trademarks and verbal or numeric components of combined word/device marks valid in the Federal Republic of Germany.

TMINT (Trademark Information)—international marks published by the World Intellectual Property Organization (WIPO). The database includes registrations, renewals, and changes made in the international trademarks registry.

TRANSIN (Technology Transfer Proposals)—offers and requests for the sale and purchase of industrial techniques and new products. The database includes citations of the patent or license with a description of the technology and identification of the contact (name, address, etc.).

URBAMET (Planning)—scientific, technical, economic, and legal information related to town planning, urban environment, and transportation. Urbamet is a multimedia database using literature, slides, and films.

WPI/L (Derwent's World Patents Index)—patents issued by 28 major industrialized countries, as well as European and EURO-PCT patents, and relevant information from "Research Disclosure" and "International Technology Disclosures."

PRICING

Rates and fees for accessing Questel's databases are shown in Table 2 (Page OL20-770-105). DARC system access is priced separately; associated fees are shown in Table 3.

OTHER SERVICES

Selective Dissemination of Information (SDI) Service

For a fee, Questel will run a customer-specified search against a designated file each time the file is updated. This service is only available for specified files; contact Questel directly for additional information.

Document Ordering Service

Questel customers can place on-line orders for any patent found in the INPI patent files. No-deposit accounts or minimum orders are required for this service. Photocopies of most documents are available at $14 each. A complete listing of the INPI Patent Collection and document prices is available from Questel.

FUTURE PLANS

Questel plans continued expansion in its areas of specialization: chemistry, patent, and trademark information. □

Questel, Inc.

	INDEX CHEMICUS ONLINE	EURECAS	POLYCAS	UPCAS	MINICAS	SPECTRA
Connect Hour						
Query Input	$50.00	$50.00	$50.00	$50.00	$50.00	$50.00
Searching	50.00	50.00	50.00	50.00	50.00	50.00
Spectral Data	50.00	50.00	50.00	50.00	50.00	60.00
Session Fee	Free	Free	Free	Free	Free	Free
Search Fees*						
Substructure						
1- 10	30.00	80.00	65.00	10.00	10.00	10.00
1- 30, min 11	30.00	75.00	60.00	10.00	10.00	10.00
1- 50, min 31	30.00	65.00	55.00	10.00	10.00	10.00
1- 75, min 51	20.00	55.00	50.00	10.00	10.00	10.00
1-100, min 76	20.00	45.00	45.00	10.00	10.00	10.00
Over 100	20.00	40.00	40.00	10.00	10.00	10.00
Exact or Family	10.00	10.00	10.00	10.00	10.00	10.00
Compound Number	1.50	1.50	1.50	1.50	1.50	1.50
Saved answer set	Free	Free	Free	Free	Free	Free
Saved query set (per month)	Free	Free	Free	Free	Free	Free
Display Fees						
On-line	0.25	0.25	0.25	0.25	0.25	0.25
Off-line 1-100	0.35	0.35	0.35	0.35	0.35	0.35
100+	0.30	0.30	0.30	0.30	0.30	0.30

***The substructure search fee schedule includes a volume discount in the EURECAS, POLYCAS, and INDEX CHEMICUS ONLINE files.**

EXAMPLE: If a user does 60 substructure searches a month in a particular file, all the substructure search fees in that file are charged at a lower rate.
EURECAS: 60 substructure searches x $55 per search = $3,300
INDEX CHEMICUS ONLINE: 60 substructure searches x $20 per search = $1,200
Note: Boolean "OR" structure searches are charged as individual structure searches.

Table 3. Fee schedule for access to the DARC system

Document Ordering Service

Questel customers can place on-line orders for any patent found in the INPI patent files. No deposit accounts or minimum orders are required for this service. Photocopies of most documents are available at $7.80 each; photocopies of trademarks are $5 each. A complete listing of the INPI Patent Collection and document prices is available from Questel.

FUTURE PLANS

Currently, many of Questel's databases are derived from French sources, reflecting the company's origins. In the future, however, Questel plans to specialize more in chemistry- and patent-related databases, which have more of an international appeal. The company also plans to integrate its chemistry and patents databases so that they work together more efficiently.□

Quotron Systems, Inc.

An independent subsidiary of Citicorp since 1986, Quotron Systems, Inc. is one of the largest suppliers of realtime financial services. More than 95,000 users (terminals) at more than 5,000 customer locations access Quotron data. These users include brokerage firms; banks; savings and loan associations; insurance companies; security, option, commodity, and futures exchanges; corporations; and individual investors.

Quotron's QUOTRON 1000 broker workstation is an integrated hardware and software system with networking capabilities. It combines realtime market data, computational and analytical tools, financial databases, administrative aids, business messaging, and the integration of voice and data. Quotron also offers databases covering fundamental and technical data on stocks, bonds, options, mutual funds, and commodities quoted on domestic, Canadian, European, and Far Eastern exchanges.

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On-Line Databases **105**

COMPANY INFORMATION

Quotron Systems, Inc.
12731 W. Jefferson Boulevard
Los Angeles, CA 90066
Telephone (213) 827-4600

Company Background

Founded in 1957 as Scantlin Electronics, Quotron Systems, Inc. now operates one of the leading stock quotation services. Quotron offers on-line financial information services to banks, brokers, and insurance companies, as well as to security, option, and commodity exchanges. It also operates an extensive nationwide and international data communications network for delivering its services. A Citicorp subsidiary since 1986, Quotron has approximately 2,400 employees.

Quotron provides services to users wanting comprehensive financial services without large computer installation cost. Specifically, Quotron offers on-line instant access to market data, news, and statistical analysis. Complete transaction and quotation information on all stocks, bonds, options, mutual funds, and commodities quoted on major domestic and Canadian exchanges, as well as expanded coverage of international equities on European, Far Eastern, South African, and Australian exchanges is available.

Quotron also offers services to support broker-related activities. These services enable brokers to perform such tasks as portfolio analysis, prospecting, analytics, word processing, electronic mail, database management, and time management.

Quotron's services also include the Computer Access and Report Service (CARS), the Dow Jones 90-Day News/Retrieval Service, and the Broadcast Information Dispatch Service (BIDS). The Dow Jones 90-Day News/Retrieval Service provides 18 full lines of story headlines per display page. The user can retrieve news stories as reported by Dow Jones, Reuters, *The Wall Street Journal*, and *Barron's* during the last 90 days. Commodity World

▷

In 1972, Quotron Systems, Inc. became the first company to automate the trading floor. Today, traders on the floors of 95 percent of the world's major exchanges use Quotron equipment.

DATAPRO RESEARCH, DELRAN NJ 08075 USA

Quotron Systems, Inc.

News is also available through Quotron. CARS is a network service allowing Quotron to access host computers to retrieve customer account updates and other financial information. BIDS provides on-line storage of large amounts of the subscribers' proprietary information.

Quotron offers the full capabilities of Securities Industry Software (SIS), a brokerage accounting software firm. SIS processes back office work such as order processing and accounting statements on an on-line basis. In addition, the SIS order management system enables brokers to send orders electronically to the exchange floors.

Quotron, well entrenched in the U.S., is now moving more into *international* markets. It is developing a strong customer base in Europe and the Far East, which includes not only local offices of U.S. firms, but also local brokers and institutions. Quotron has also expanded into Belgium, France, Hong Kong, Japan, Luxembourg, Singapore, Switzerland, The Netherlands, West Germany, Scotland, Australia, and Taipei. In Canada, Quotron provides services through its exclusive representative, Dataline.

Competitive Position

Quotron's primary competitors are Reuters and Telerate, both aggressive companies that, overall, seem to be gaining on it. Quotron also competes with Automated Data Processing (ADP), although Quotron feels ADP's systems are significantly less advanced than those available through its QUOTRON 1000 workstation. In the stock quote machine business, Quotron's other competitors are Shark and Bridge.

Quotron feels it leads the retail equities market. It also reports aggressive cultivation of the foreign exchange market (which Reuters now dominates) and the fixed income market (in which Telerate has the largest share).

During the last few years, Quotron has faced increased competition from Reuters, Telerate, and new competitors such as Shark and Bridge. This heavy competition is taking its toll on Quotron's revenues. In fact, according to the *New York Times* (February 5, 1989), some investors and competitors now question the wisdom of Citicorp's 1986 acquisition of Quotron. There is some speculation, for example, that Citicorp is not sure just what to do with Quotron, in which it has a total investment of roughly $900 million. Citicorp acquired Quotron as part of an overall strategy to be the undisputed leader in financial services. But, speaking to *The New York Times*, a former senior executive of Citicorp said that Quotron has been a "disappointment," and that "if they don't get at it soon, Reuters and Telerate will."

One action Quotron is taking to shore up its position is the sponsorship of a user's group, dubbed Quotus. Quotus members are tracking six areas of concern: administration, repair and maintenance, database services, documentation and training, office services, and clearing services. Some of the measures that Quotron is taking to address concerns of current users are automating customer service and improving speed and accuracy of order taking.

RESOURCES AND FACILITIES

Processing Centers

Quotron's main computer center in New York City has two complete systems running simultaneously: a primary system and a backup system (which automatically becomes the primary system should a problem develop). The company also maintains a full computer center in Philadelphia which receives the same input data as the New York center and can provide backup within minutes. Each regional computer center and remote concentrator is also fully equipped.

Microcomputer Software/Services

Quotron Systems offers its clients the *QUOTDIAL* Service, a dial-in service enabling personal computer and video display terminal users nationwide to access its database of equities, bonds, commodities, options, financial instructions, and statistics. In addition, Quotron recently introduced its Open Windows family of personal computer products, described more fully in the "Delivery Systems" section of this report.

Customer Support Services

Quotron maintains its own nationwide customer engineering organization, comprising more than 500 computer technicians staffed at 60 customer engineering offices, to provide preventive and remedial maintenance. Technical personnel in the company's headquarters offer further support.

Sales and Marketing Services

Quotron handles all sales through the home office and the following sales offices:

- Atlanta, GA
- Los Angeles, CA
- San Francisco, CA
- Miami, FL
- Chicago, IL
- St. Louis, MO
- New York, NY
- Cincinnati, OH
- Portland, OR
- Dallas, TX
- Philadelphia, PA

Quotron Systems, Inc.

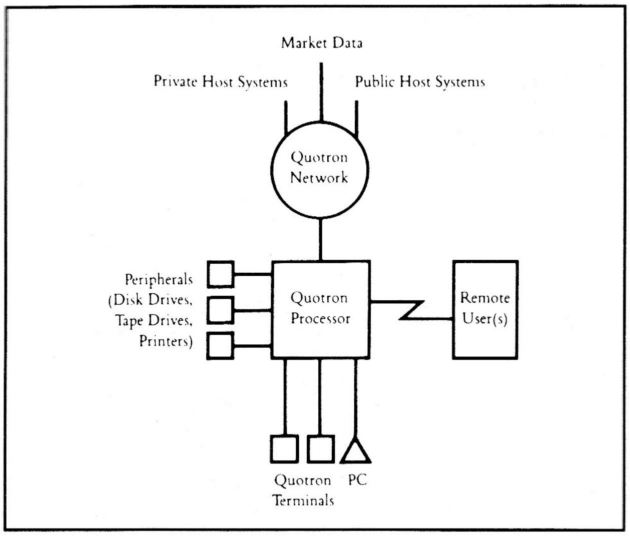

Figure 1. The QUOTRON 1000 supports integrated information systems companywide.

Internationally, QUOTNET, a subsidiary of Quotron Systems, handles sales from its offices in London, Hong Kong, Singapore, Sydney, Switzerland, West Germany, Paris, Brussels, Amsterdam, and Luxembourg. Information Services, Inc., handles sales of the company's services in Tokyo.

APPLICATION-SPECIFIC SERVICES

Quotron's market data and trading and decision support services provide users with a wide range of market data, news, statistics, and analyses. These services include:

- Alert Manager—provides instant on-screen notification of important messages.

- *Bid/Ask Montage*—offers a dynamically updated display on all bids and offers, with size, for a given security, from participating exchanges.

- *Bond Calculator*—allows a bond trader to calculate yield-to-maturity, bond price, yield and price to call, as well as pre- and posttax yields. Displays the difference in calculations if a variable is changed.

- *Commodity Class Display*—displays spot, contract, and option prices for any commodity, by contract month or option series.

- *Commodity Trading Monitor*—provides a display of commodity trading data in a module format similar to the familiar Quoteboard. The data is displayed in a format showing close, open, high, low, volume, and last prices.

- *Dow Jones 90-Day News/Retrieval*—enables subscribers to recall news headlines and stories reported over the past 90 days by Dow Jones, *The Wall Street Journal*, and *Barron's*.

- *Dynamic Option Class Display*—displays and updates theoretical value calculations, hedge ratio values, and a performance evaluation graph (in addition to the standard option class). All parameters may be changed.

- *Equity Transaction Service*—provides the time and sales of all transactions for a given security. It features two types of displays: the transaction display and correction display. This service reports trades on all New York- and American-listed stocks, as well as the regional exchange-listed stocks for the same issues.

- *FX Quote*—a new Quotron service that delivers realtime exchange rates on currencies traded in the world's major financial centers—New York, London, Zurich, Tokyo, and Hong Kong. FX Quote provides foreign exchange information rates to cross-border investors in the equities market, giving investors information needed for analyzing the impact of currency fluctuations on securities prices. The data can be displayed concurrently with other Quotron market data and services. It is available in a variety of formats, including Quoteline, Monitor, and Class Displays.

- By the end of 1988, eight banks had become FX Quote contributors. They are Chemical Bank (London), Citibank, Barclay's Bank, Midland Bank, National Westminster Bank, Swiss Bank Corporation, Union Bank of Switzerland, and Chemical Bank (New York).

- *Graphic Service*—contains a time versus last sale range/price bar graph on commodity contracts, underlying securities of listed options, and selected statistics.

- *Option Class Display*—reports trading activity for all option series for an underlying security by expiration month, strike price, and exchange.

- *Option Trading Information (OTIS)*—displays a list of each sale of a specified option series in the sequence. OTIS can retrieve a list of sales by volume and the current bid/ask security price.

- *Programmed Indexes*—allows users to custom-design an index with any combination of securities, options, commodities, and statistics. Calculates the value of the index in realtime and allows monitoring of the value via the *Enhanced Monitor* service.

- *SEAQ (Stock Exchange Automated Quotations) International Level II Montage*—introduced in 1988, is a trading and decision support service. SEAQ International presents dynamically updated bid/offer prices for non-U.K. equities traded on the International Stock Exchange (ISE) in London as contributed by individual ISE market makers. It is a full-page data display service highlighting the best bid and ask price for a requested stock. The data includes market maker code, bid, ask, size, and trade time (GMT) on a single line in a format Quotron believes is easy to read. Up to 32 market maker quotations for a requested SEAK International issue are

Quotron Systems, Inc.

displayable on a single page. Prices, shown in local currency or dollars, are net of commissions or other charges.

- *Vickers Holdings*—provides for the recall of the security holdings of mutual funds, banks, insurance companies, and college endowments. Displays include a list of institutions holding any security, a list of the holdings of any institution, and a directory of institutions.

Quotron's Network Services include:

- *Broadcast Information Dispatch Service (BIDS)*—designed to provide on-line storage and rapid retrieval of subscribers' sales, products, research, and other information, while simultaneously ensuring protection from unauthorized access. Data may be subdivided into chapters and located using the BIDS directory display.

- *Computer Access and Report Service (CARS)*—provides access to a subscriber's files using Quotron's computing and communications resources. This service permits Quotron customers to retrieve client information. CARS applications include account profiles, statements, security cross-reference, and research opinions from the subscriber's analysts.

- *Terminal Emulation Service*—offers users remote access to in-house databases. With this system, Quotron terminals can interface to any central computer system that supports IBM 3270 protocols.

Quotron's *Broker Support Services* furnish a full complement of services to support broker-related activities. Functions include portfolio analyses, prospecting, analytics, word processing, electronic mail, database management, and time management. These applications are fully integrated with one another and with market information from Quotron's *Price and Market* database. A description of these services follows:

- *Broker Portfolio System*—designed to organize the broker's account bookkeeping, the system maintains four libraries which contain account and related nonfinancial information for each client, securities and nontransaction data related to each security, transactions, and closed transactions.
- *Electronic Mail*—allows users to send messages between local and remote Financial Office Services Systems. Received messages can be replied to, filed, or forwarded.
- *Spreadsheet Service*—a matrix-oriented work space for performing financial or statistical calculations, creating mathematical models, or preparing forecasts and budgets. It interfaces with the Quotron market database and broker support services.
- *Word Processor*—includes a text editor, document control system, text formatter, spelling checker and/or corrector, proofer, and production of copy. It also includes a form letter generator, which provides the ability to select and draw information from the customer database.

Quotron's Development Tools are used for building customized applications with a consistent user interface. These tools include:

- *Forms Development Library*—permits free-form text entry of labels, prompts, and entry fields. By using various graphics characters, boxes, and bullets, other design formats can be created.
- *Unify Database Management System*—allows users to create and access multiple databases such as local customer files and/or prospect files. The database is maintained under a relational model which organizes data as a series of tables.
- *Virtual Terminal Emulator*—serves as an interface between applications programs and user workstations. The emulator can be used to partition users' CRT screens; users can view output from more than one service at a time. A single cursor can be moved from partition to partition to direct input.

DELIVERY SYSTEMS

QUOTRON 1000

The QUOTRON 1000 workstation (Figure 1) combines realtime market data with office automation tools such as word processing, personal computing, electronic mail, and a variety of analytical services to increase production and efficiency. The QUOTRON 1000 allows for the delivery of Quotron services, custom applications, and third-party software in an integrated environment.

Based on the Motorola 68000 Series of microprocessors and the UNIX operating system, with its related utilities, the QUOTRON 1000 minicomputer supports industry-standard communications protocols and a variety of workstations—from cluster and serial terminals to personal computers.

New PC Solutions

Quotron reports a commitment to developing products for open computing environments. The company recently introduced *Open Windows*, a family of PC products delivering Quotron's realtime financial information services to the Microsoft Windows environment. Microsoft Windows, the extension of the DOS operating system, brings many features of the Apple Macintosh (the mouse, icons, drop-down menus, and high-resolution graphics) into the IBM PC environment. It allows multiple applications to work together with the easy exchange of data and graphics.

The initial Open Windows product is composed of three applications. QuotData, a server application, delivers Quotron market data from the QUOTRON 1000 to a local database on the PC for use with custom and off-the-shelf software such as the Microsoft Excel spreadsheet.

QuotChart, a charting and technical analysis package, offers realtime charts, along with technical tools to assist traders and money managers in making faster, more informed decisions. The QuotChart Service receives realtime pricing via QuotData. QuotTerm, a terminal emulation application, permits fast access to all Quotron services while allowing the user to view other applications operating under Microsoft Windows on the PC screen.

Quotron's Professional Service group provides consulting and contract services for developing financial applications on the QUOTRON 1000. This group assists customers in tailoring the QUOTRON 1000 to meet individual needs and custom applications.

NETWORKING SERVICES

The Quotron communications network provides for information dissemination and access over a national high-speed, multichannel data transmission network which connects the main computer center in New York with regional computer center sites and more than 7,800 customer offices in over 950 cities. Quotron is continually enhancing and expanding the network to increase efficiency, throughput, and data storage. All of Quotron's regional computer centers and remote communication concentrators are duplexed and monitor the operation of all office computers within the system, on-line.

ON-LINE DATABASES

Price and Market Data

Quotron's constantly updated proprietary database offers complete transaction and quotation data on stocks, bonds, options, mutual funds, and commodities quoted on domestic, Canadian, European, and Far Eastern exchanges. The database reports on more than 200,000 foreign and domestic instruments. In addition, popular market and Quotron statistics, dividends, earnings, industry group information, earning forecasts, special graphs, and business and economic news are available.

Financial Database Services

Subscribers can access a range of third-party databases at the Quotron terminal. These services include informational summaries, fundamental research, debt-related information, and advisory services for option trading.

Argus Research—analyzes and recommends approximately 450 leading listed and over-the-counter corporations. The reports are prepared by securities analysts and are available the same day.

Bridgewater—a global perspective on economic commentary.

Corporatewatch—produced by McCarthy, Crisanti & Maffei, Inc., provides timely analysis and information regarding the U.S. corporate bond market. Data includes company comments, rating changes, "ratingwatch," debt and new issues, equity new issues, and "street talk."

Disclosure—contains business and financial information extracted from annual and periodic reports filed with the Securities and Exchange Commission for over 9,000 public companies. This includes all NYSE, all ASE, and over 6,000 OTC companies.

Innovest—a stock technical analysis reporting service, generating numerical and textual recommendations on 9,000 stocks.

The Market Guide—reports on NASDAQ and OTC companies.

Markets Advisory—provides market-timing information and advice to major brokerage firms, mutual funds, and money management firms. Its services include bar charts and point and figure charts with buy and sell signals for stocks, industries, market indices, financial markets, and commodities.

Moneywatch—from McCarthy, Crisanti & Maffei, Inc., provides investors with up-to-the-minute projections and analysis, on a realtime basis, of developments impacting the financial markets.

Munifacts—the newswire service of The Bond Buyer, Munifacts reports on the municipal bond market, the money markets, corporate bond market, and U.S. government and federal agency markets, as well as flashing news that impacts the fixed-income markets.

OTC Bluesky—Bluesky registration for information on NASDAQ stocks.

OTC NewsAlert—180-day news and information retrieval on over-the-counter securities.

Pershing Instant Comment (PIC)—provides analyses and research opinions on over 400 key listed and over-the-counter companies. The service includes a summary of each company's operations and activities, investment opinions, and information on security. In addition, PIC lists 27 separate industry comments.

Pink Sheets—derived from the National Quotation Bureau, provides a realtime listing of more than 15,000 issues of small-to-medium sized companies.

Quotron Symbol Guide—lists companies and their stock symbols.

Standard & Poor's Marketscope—a computerized research service that provides a comprehensive analysis of stock and industry developments.

Quotron Systems, Inc.

▷ *Stewart Data*—provides individual screens for a wide variety of popular stock and index option strategies. Stewart Data Service's ranking capabilities provide the user with a list of the 15 best opportunities for each chosen screen.

Telerate—Telerate Cash Market Profile provides quotations on government securities, corporate bonds, and money market instruments.

Track Data's Optrack Plus—analyses of listed options and underlying securities, as well as weekly, monthly, and annual equity graphs.

VESTOR—plain-English fundamental/technical analyses on user-set parameters.

Vickers Holdings—a compilation of documents on institutional holdings of equities, preferreds, and bonds from Vickers Associates.

Vickers Inside Trading—updates on SEC forms—change in beneficial ownership, notice of proposed sale of security, and 5 percent equity ownership.

Wall Street Estimates—a trade name of Zacks and Co., Inc., Wall Street Estimates' consensus estimates show current status and recent history of individual analysts' estimates for 3,000 companies.

Wright Investors' Service—provides a comprehensive analytical service called Stat-Scan for 1,600 companies. Single-page screens show 45 data items of price performance and fundamental analysis using current and historical corporate information. Screen displays include Wright quality ratings and seven different percentile rankings.

OTHER SERVICES

Quotron designs and maintains its own equipment.

Remote service on the QUOTRON 800 and the QUOTRON 1000 is designed to provide a satellite office with the same complete financial resources as any regional office. A small office can have immediate access to service features previously restricted to large office operations, such as buy/sell interests, sales strategy, research reports, and product inventory information. Remote service includes the following:

- Access to all standard services, including quotations monitoring, news, and tickers.
- Access to database network services, such as message switching; order entry; customer accounts; storage and distribution of product inventory, research data, and other in-house information; inter-/intraoffice messages; and various terminal emulations.
- Access to third-party financial database services, such as Vickers Holdings, Pink Sheets, and Telerate.
- Quotron's PC products (PC800 and PC1000) allow MS-DOS PCs access to Quotron services, establishing a multipurpose workstation for market data and applications.

FUTURE PLANS

Quotron knows it must supply superior performance and constant service enhancement to maintain its market position. With the QUOTRON 1000, supported by a worldwide data communications network, and Citicorp's backing, the company feels strong enough to continue growing in an expanding market. Quotron is currently installing equipment (at the highest rate in its history) both in customer offices and in the network. Immediate plans for expansion include markets in Continental Europe, as well as in the Far East. Citicorp's extensive international network will facilitate this expansion. □

Reuters

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Synopsis

Editor's Note
Founded in 1851, Reuters collects and disseminates financial news and other information. While in a sense Reuters' business is the same as it was more than 135 years ago—providing and disseminating financial information and general news—it now offers a broader range of information, in formats that could not have been envisioned then. Reuters is one of the world's leading electronic publishers.

Report Highlights
London-based Reuters primarily serves two markets: the business and financial community and the news media. For the business community, Reuters provides data on foreign exchange and money market rates, commodities, securities, bonds, shipping, energy, and coins and precious metals through its *Reuter Monitor* and other services. Through its subsidiary, Rich, Inc., it designs and installs sophisticated trading rooms for banks and brokerage houses throughout the world.

To the news media, including newspapers, radio and television networks and stations, and government agencies, Reuters supplies news items generated by its staff of journalists, photographers, and camera operators.

Vendor
Reuters
c/o Reuters Information Services Inc.
1700 Broadway
New York, NY 10019
(212) 603-3300

Analysis

Company Background

Baron Paul Julius von Reuter founded the company that bears his name in England in 1851. Before then, von Reuter was in the business of transmitting stock market quotations. Operating before telegraphs were in widespread use, von Reuter used carrier pigeons to carry news of quotations. In 1851, after the Dover-Calais cable was laid, he began sending stock market quotations between London and Paris telegraphically. Von Reuter soon expanded his service to other European countries and broadened its coverage to include general and economic news.

Today, Reuters supplies financial data and news to banks, securities and commodities firms, other financial institutions, industry, government, and the media. Approximately 194,000 Reuter video terminals in more than 125 countries are used to retrieve and disseminate market data on currencies, securities, and commodities. The company believes that it offers the international financial and business communities and media the "widest range of realtime information available from any single commercial source." Included is the growing area of textual and numeric databases offered through its historical information products.

The *Reuter Monitor* system, introduced in 1973, was designed to give traders access to current foreign exchange quotations via dedicated terminals. Over the years, Reuters expanded the system to include data on money market instruments, commodities, equity securities, bonds, shipping services, energy products, and coins and precious metals. The *Reuter Monitor Dealing Service*, introduced in 1981, enables dealers in foreign exchange, bonds, and bullion to communicate with one another directly and to conduct and conclude trades confidentially. That part of Reuters' business, in particular, has grown dramatically. A new system, Dealing 2000, is designed to provide a price-matching system for automated execution of trades.

Reuters went public in 1984. In 1985, it acquired Rich, Inc., an Illinois-based designer of financial trading rooms. In spring 1987, Reuters acquired I.P. Sharp, one of Canada's leading database vendors and a top vendor of on-line numeric data. I.P. Sharp is one of 10 companies that Reuters acquired within three years.

Truly an international company, Reuters derives a large percentage of its revenues from its European operations. The next largest contributor is Reuters Asia, followed by Reuters America.

Reuters has approximately 10,000 employees. The parent holding company, Reuters Holdings PLC, is headquartered in England at 85 Fleet Street, London EC4P 4AJ; telephone 01-250-1122. Its stock is listed on the International Stock Exchange and with NASDAQ in the U.S.

Competitive Position

Reuters competes with the many companies supplying electronic information services to business and financial markets and to the news media. While this places Reuters in an extremely competitive arena, Reuters fared well in the 1980s; between 1982 and 1987 alone its revenues jumped from $266 million to $1.6 billion.

Reuters derives the bulk of its revenues outside the U.S. In the international market, it competes chiefly with Telerate (of which Dow Jones is a controlling shareholder); Commodity News Service Inc. (a Knight-Ridder company); Quotron (owned by Citicorp); Associated Press and Dow Jones (operating jointly under the name AP-Dow Jones); and ADP. Reuters also reports it competes in this market with companies supplying specific types of financial information. These competitors include the Japanese information service Quick; Telekurs A.G., owned by a group of Swiss banks; and Topic, a service of the International Stock Exchange.

Reuters views the United States as its most competitive market. In supplying money market services, Telerate is its primary competitor. Reuters readily admits that Telerate's data services covering U.S. government securities and domestic money market instruments have achieved greater market penetration than those Reuters offers. In the realtime securities services market, Reuters competes with Quotron and ADP. Both of those companies have greater market share than Reuters, but Reuters only entered this market in 1987 (with its Equities 2000 service).

Two Reuters acquisitions, Finsbury Data Services in 1986 and I.P. Sharp in 1987, may prove increasingly important as Reuters faces growing competition. Finsbury brought to Reuters the *Textline*, *Newsline*, and *Dataline* textual databases. I.P. Sharp contributed the industry's most extensive numerical databases, greatly extending the historical data available to Reuters' subscribers. Reuters is connecting I.P. Sharp's computers to its Integrated Data Network so that Reuters information will be stored and made available as a range of historical data products.

Resources and Facilities

Processing Centers

Reuters' communications network is based on three main technical centers located in London, Tokyo, and Long Island, NY. Reuters has duplicated its key central computer systems and has also arranged for alternate power sources in the event of a system breakdown or power failure. Fire control and system security are also priorities. Digital Equipment Corp. is the primary supplier of its computers. Codex, Racal-Milgo, Timeplex, and AT&T Paradyne supply its high speed modems and multiplexers.

Customer Support/Sales and Marketing Services

For marketing and management purposes, Reuters breaks its operations down into three geographical areas:

- Reuters Europe, Middle East, and Africa;
- Reuters Asia; and
- Reuters America (covers the U.S., Canada, the Cayman Islands, Bermuda, and Latin America.)

Pricing

Reuter Monitor services range in price from $625 per month to several thousand dollars per month depending on the package of services chosen. For further information, contact the company directly.

Networking Services

Reuters' data centers are interconnected via dedicated international communications circuits, primarily relying on satellite and land-based telephone lines and wideband circuits. These circuits are almost always leased from government communications authorities (PTTs), except in the United Kingdom, the U.S., Hong Kong, and Canada, where they are sometimes leased from private carriers.

Outside the United Kingdom and North America, communication between data centers and Reuters subscribers is mainly through dedicated land-based telephone lines leased from PTTs. Communication between data centers and subscribers in the United Kingdom is also through dedicated terrestrial telephone lines; in North America these lines are supplemented by satellite, coaxial cable, and microwave transmission systems.

Integrated Data Network

Reuters is expanding its use of its Integrated Data Network (IDN), a data networking system that the company envisions will replace its current distribution system. IDN will enable the company to increase the speed of data distribution and furnish various packages of products without the need for separate communications circuits, terminals, and software development.

Reuters implemented the first phase of IDN in November 1986 with the delivery to the London data center of securities, commodities, and options data from its technical center in Long Island. In 1987, Reuters used IDN to carry its Reuter 2000 series of products.

On-Line Databases

Reuter Monitor Video Retrieval System

Reuters introduced its *Reuter Monitor* video retrieval system in 1973. The system was designed as a fast and convenient way for dealers in the international foreign exchange markets to obtain current quotes without using the telephone or telex. Since then, Reuters has enhanced the service. It now offers dealers market data on money market instruments, commodities, securities, bonds, shipping, energy, and coins and precious metals.

Reuters receives its information from approximately 162 exchanges and over-the-counter markets, from data contributed directly by more than 3,715 subscribers in 82 countries, and from over 1,000 journalists and photographers. Its services are received by more than 28,000 subscribers worldwide.

Subscribers receive the service via Reuter video terminals. Reuters' color video terminal, "The Advanced Reuter Terminal," simultaneously displays prices, graphs, and news on a single screen. The terminal is based on a personal computer and gives subscribers leeway to choose the way information is displayed. For example, the screen can be divided into a number of windows of various sizes so that more than one page of information can be viewed together with current graphs. The retrieval service includes an automatic alarm that alerts subscribers to important news developments even if their terminals are displaying other information.

The business and financial news options available through *Reuter Monitor* are described as follows. Most users subscribe to two or more of these services.

Foreign Exchange and Money Market Services

The first services offered through the *Reuter Monitor* video retrieval system, Reuters Foreign Exchange and Money Market Services, were introduced in 1973. Collectively, these and other services now provide foreign exchange quotations for 108 currencies, Eurodeposit rates for 41 currencies, quotations on money market instruments (including government securities, bankers' acceptances, and certificates of deposit), and gold and silver bullion prices. This information is available on single video pages, each with information provided by a single contributor. It is also available on composite video pages, which offer data on a particular currency or money market instrument, on a range of currencies or instruments, or in graphic format.

Quotations may be enhanced with Reuters *Money News* retrieval services and with background economic data. The *Money News* retrieval services, which Reuters journalists produce, offer a steady stream of important news stories for international, regional, and national money markets. Background economic data include international trade and payments balances, money supply data, official monetary reserves, and discount, and other key interest rates and consumer prices.

Commodities Services

Collectively, these services provide quotations for commodities futures contracts and on options series, including those for grains, oilseeds, coffee, cocoa, sugar, rubber, other agricultural products; oil and its derivatives; nonferrous and precious metals; currencies; financial instruments; and stock indexes.

Subscribers may also receive Reuters *Commodities News* retrieval services, background data on commodities, pertinent foreign exchange and money market data, commodities information in graphic format, and weather forecasts.

Securities Services

Reuters' Securities Services provide prices and associated data on securities and exchange-quoted options from securities exchanges and over-the-counter markets worldwide. Price movements of selected securities representing specific markets are retrievable. Subscribers can program their video displays to update and display a securities portfolio of their choosing. The subscriber is alerted when predetermined buy or sell limits are reached, regardless of what is being displayed at the time.

Subscribers may also receive *Reuters Securities News* retrieval services, which contain the latest news likely to affect securities markets, background economic data, and company reports and announcements.

Bonds Services

Reuters has offered services focusing on Eurobonds and foreign bonds since 1975. These services offer quotations primarily for Eurobonds for which the main trading takes place directly between dealers outside securities exchanges. Data on bonds traded on various securities exchanges and pertinent foreign exchange and money market data are also available. In addition, an historical database covering more than 4,800 Eurobonds is available.

Subscribers to this service may also receive *Reuters Securities News* retrieval services and the *Capital Market News* retrieval service.

Shipping Service

Reuters Shipping Service provides oil tanker and dry bulk cargo vessel information. The service is geared to shipping brokers, charterers, and ship owners. It provides information on the availability of, and requirements for, oil tankers and dry bulk cargo vessels at various ports for specific routes. The service also includes *Reuters Shipping News* and weather forecasts.

Energy Service

This service, first offered in 1982, provides brokers, dealers, producers, refiners, transporters, and chemical companies with quotations of spot and futures prices for crude oil and petroleum products and related recommendations. *Reuters Energy News*, weather forecasts, and access to specialized energy information from third-party sources are generally included with the service.

Coins and Precious Metals Service

This service provides quotations for a variety of gold and silver coins and precious metals, including gold, silver, platinum, and palladium.

The 2000 Series

Launched in 1987, this series includes *Reuters Equities 2000*, *Commodities 2000*, and *Energy 2000* services, all of which are available in Europe and North America. Reuters views these as the first of a new generation of information products and services for financial markets delivered via an Integrated Data Network (IDN). These services provide access to a database of exchange quotations and the *Reuters Monitor* database of news and contributed data.

Other Services

Reuters has created other services for the business and financial community. These combine realtime news and prices with archival information, data processing facilities, graphic displays, and high-speed deal-making communications.

Dealing Services

Reuter Monitor Dealing Service

The *Reuter Monitor Dealing Service*, launched in 1981, enables dealers in various countries to communicate directly and instantly to negotiate and conclude trades. The dealers use a special Reuter video terminal. A hard copy record of each transaction is printed out at the subscriber's location.

Reuters markets this service as a "fast and reliable alternative to dial-up telephone and telex communications." Currently, it is available to dealers associated with foreign exchange, bullion, and bonds. It has also been introduced in Japan and China.

Dealing 2000 Service

The *Dealing 2000 Service* provides a price-matching system for automated execution of trades.

Instinet Trading Service

The *Instinet Trading Service* provides continuously updated market data. It permits automated trading of most equity securities, American Depository Receipts, and options on those securities that are listed on U.S. stock exchanges or included in NASDAQ's National Market System. Trades on orders of up to 1,000 shares can be executed at the best price for that particular security. Larger blocks can be negotiated as well.

Order Entry Service

Introduced in 1987, Reuters' *Order Entry Service* is designed to enable subscribers to transmit to their brokers via the *Reuter Monitor* system and buy and sell orders for commodities futures. It was also designed to enable brokers to confirm transactions to their clients using the same system. The service is not designed for automated execution of trades. Rather, after the broker receives the client's instructions, the order is executed in the customary manner (e.g., via telephone, telex, or on the floor of the exchange).

Back Office Services

Reuters offers a number of back office services. For example, *Instant-Link* connects investors, brokers, and other parties to a securities transaction through a communications network for order entry, trade reporting, affirmation, and settlement. *Blend* enables securities borrowers to advise brokers and potential counterparties of their requirements. It also enables lenders to indicate the securities available for lending. *Stream* lets international banks monitor their current global exposure and sovereign risk.

Data Manipulation Systems

Reuters now makes available various optional add-on systems that enable a Reuter video terminal to be linked to a personal computer for manipulating data. Graphics services enable subscribers to foreign exchange and money market, commodities, and energy services to convert data to graphic displays. Its *Abacus* service permits subscribers to perform calculations using realtime foreign exchange and money market information. Reuters *News-Search* capability enables subscribers to search via key word or phrase for any item appearing in Reuters' full news file for the preceding 24 hours. The *Reveal* software package helps brokers manage clients' securities portfolios.

Historical Data Services

Reuters is developing additional historical databases to supplement its realtime information services. The first of these products was introduced in 1984 and consists of historical and background data for Eurobond dealers. This service, which devotes a single page to each of 4,800 bonds, indicates the traders who have recently updated a quotation for a bond and also displays a range of permanent and variable data on that bond. Another service, Reuters *Country Reports Service*, blends access to the latest Reuters world news with a database containing economic, political, and statistical information for each of 50 countries.

Reuters is in the process of augmenting its textual and numeric data services with those of two recent acquisitions, Finsbury Data Services and I.P. Sharp Associates.

Finsbury Data Services

Acquired by Reuters in December 1986, Finsbury Data Services Limited produces textual databases for financial and related markets primarily in the United Kingdom. Finsbury's products include *Textline* and *Newsline*, databases providing access to the abstracts or full text of publications published worldwide. Finsbury also produces the *Dataline* database, which contains corporate financial statements.

I.P. Sharp Associates

Reuters acquired this leading vendor of numeric databases in June 1987. Sharp's databases, which are compiled mainly by third parties, consist primarily of the following:

- Financial data, including stock and bond prices and exchange rates
- Economic data, including national statistics
- Energy and aviation data

Media News Services

Reuters provides economic, business, political, arts, sports, science, and general interest news to newspapers, radio and television stations, governments, and international institutions. These services are received in 158 countries, either directly by subscribers or through national news organizations. Reuters also operates the *Reuters News Pictures Service*, an international news picture-gathering and editing service. ■

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Datapro Research Group. Delran NJ 08075 USA

Securities Data Company, Inc.

Securities Data Company, Inc., part of the financial information group of the International Thomson Organization, is one of the world's leading suppliers of financial information. The company supplies financial information on municipal, corporate, and international securities and merger and corporate transactions to more than 200 financial institutions and allied companies worldwide. Access to the databases is through direct dialing or via the CompuServe data communications network.

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COMPANY INFORMATION

Securities Data Company, Inc.
1180 Raymond Blvd.
Newark, NJ 07102
Telephone (201) 622-3100

Company Background

Securities Data Company, Inc. specializes in providing access to on-line databases covering new issues of securities and merger and corporate transactions. Its databases include information on corporate new issues, municipal debt, private placements, international new issues, and mergers and corporate transactions.

Established in 1975, Securities Data was sold to Capital Cities in 1983. It became a subsidiary of the International Thomson Organization, a worldwide publishing and energy company, in February 1988. It has 75 employees.

Securities Data uses Hewlett-Packard computers to make its data available on-line. The company views the investment banking community as its target market. Its clients include:

- Investment banks
- Financial brokerage firms
- Commercial banks
- Financial institutions
- Advertising firms
- Financial publications
- Consulting firms
- Law firms

Clients can gain access to Securities Data Company's computer systems by direct dialing to the computer center or via the CompuServe worldwide data communications network.

Competitive Position

Securities Data Company, Inc. claims it offers a wider range of databases on corporate securities and transactions than any other company. Its competitors include Standard & Poor's Compustat Services, Inc. (SPCS), Interactive Data Corporation, CompuServe, and Dow Jones News/Retrieval.

Working in Securities Data Company's favor is its membership in the International Thomson Organization's financial information group. Other members of this group include American Banker/Bond Buyer, Technical Data Corporation, First Call, CDA Technologies, AUTEX, and International Financing Review.

RESOURCES AND FACILITIES

Processing Centers

The Securities Data Company computer center, located in Newark, houses Hewlett-Packard computers that control access to the company's proprietary databases through its own software systems.

Systems Software

Data and Database Management: Securities Data Company's securities databases are maintained by its staff. Clients are not generally involved in the details of database management and experience only the user interface to the various databases.

The user interface to the databases is a menu-driven system that chooses from lists of databases, selection criteria, and report formats. Once all required choices are made, the query is completed and the requested reports and analyses are generated. A command level is available for advanced users.

Languages: Securities Data Company clients are not generally involved in programming. The company does provide custom programming on request.

Customer Support Services

Securities Data Company's customer support staff, based at its Newark office, answers questions from clients concerning use of the company's database inquiry system. Service is available 24 hours a day, 7 days a week.

Securities Data Company also supplies manuals documenting the use of its system and provides training to clients.

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Securities Data Company, Inc.

Sales and Marketing Services

Securities Data Company's marketing efforts are carried out exclusively from its Newark offices. The company's primary clients are brokerage houses, corporations, investment banks, commercial banks, advertising firms, consulting firms, law firms, and financial publications.

NETWORKING SERVICES

Clients may access Securities Data Company's Hewlett-Packard computers either through direct dial-up or via the CompuServe worldwide telecommunications network.

ON-LINE DATABASES

Mergers and Corporate Transactions

Mergers and Corporate Transactions—tracks mergers, acquisitions, leveraged buyouts, tender offers, recapitalizations, spin-offs, self tenders, repurchases, stake purchases, and exchange offers. The database contains information from 1981 onward and is continuously updated. The information in the database covers such areas as:

- Target company's financial position
- Acquiring company's financial position
- Advisors and fees
- Specifics of each transaction
- Price tracking
- Geographical location and line of business of both target and acquirer
- History of transaction

This database is used by such clients as investment banks, law firms, and corporations in producing reports, in market research, and in the structuring of new mergers.

New Issues of Corporate Securities—provides data on publicly offered new issues of taxable debt, common stock, and preferred stock in the U.S. The data covers 1970 to the present and is continually updated. SDC also maintains databases on medium-term note programs, shelf registrations, and underwritten calls. Approximately 125 data items are maintained for each issue, including the following:

- Description and terms of the issue
- Underwriters and fees
- Capitalization of issuer
- Data from financial statements
- Information from prospectus
- Geographical location of issuer and line of business
- For common stock
  - —number of shares
  - —price history
  - —aftermarket price performance
- For preferred stock
  - —dividends
  - —redemption and sinking fund provisions
  - —details on adjustable rate and convertible issues
- For debt issues
  - —coupons
  - —maturity
  - —trustee
  - —call and sinking fund provisions
  - —details on floating rate, convertible, and mortgage issues

This database is used by clients in investment banks, brokerage firms, and other financial institutions for producing reports, market and historical research, and making pricing decisions.

New Issues of Municipal Debt—provides data on new issues of publicly offered and privately placed tax-exempt and taxable debt. The information in the database covers from 1980 to the present and is continually updated. The information, for all proceed types, includes:

- Coupon
- Offering price
- Maturity
- Call and sinking fund provisions
- Underwriters and fees
- Trustee
- Geographical location of issuer

This database is used by clients in investment banks and commercial banks and government agencies to assist in producing reports, in market and historical research, and in making pricing decisions.

Private Placements—provides information on private placements of corporate securities since 1981. Database users include banks, brokerage firms, and other financial institutions. The database is also designed for producing reports and market and historical research. It includes such information as:

- Total amount placed
- Coupon rate
- Maturity
- Agents
- Purchasers
- Geographical location of issuer
- Number of shares
- Offering price

Eurobond Database—covers public and private Eurobond and Euro-equity issues in all currencies from 1980 to the present. The database allows the user to select, sort, and summarize issues by criteria such as currency, country, amount, security type (fixed/floating/convertible/warrants), date range, years to maturity, ratings, put features, and lead and colead managers and fees. The database also contains data on new issues of foreign bonds.

Securities Data Company, Inc.

▷ OTHER SERVICES

In addition to its on-line securities databases, Securities Data Company offers custom programming on request to assist clients with special information needs.

Securities Data Company also publishes surveys based on the information contained in its New Issues databases.

FUTURE PLANS

Securities Data Company reports it will continue to improve its coverage of the securities industry, anticipating and responding to changing market conditions in order to provide the highest quality service to its clients. □

Source Telecomputing Corporation (STC)

Source Telecomputing Corporation (STC) has operated The Source since 1979. An on-line service oriented to both home and business users, The Source offers 750 features and programs in four major categories: news, weather, and sports; communications; education, shopping, and games; and business and investing.

Among The Source's increasing selection of business-oriented services are realtime stock quotations and on-line trading and enhanced Private Network Services. SourceMail, a sophisticated electronic mail service, is offered as part of the company's communications services.

In mid-1987, Source Telecomputing Corporation was acquired by a venture capital firm. Prior to that it was owned by The Reader's Digest Association.

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COMPANY INFORMATION

Source Telecomputing Corporation (STC)
1616 Anderson Road
McLean, Virginia 22102
Telephone (703) 734-7500

Company Background

The Source was founded in June 1979 as Source Telecomputing Corporation's on-line information service. The Reader's Digest Association had a majority interest in the company dating from December 1980. It was then acquired by a venture capital firm—Welsh, Carson, Anderson and Stowe—in June 1987.

Originally, The Source was designed as an on-line service for home (nonprofessional) computer users. More recently, The Source has considerably broadened its business-related services, and it now offers many services for investors. All told, The Source now offers over 750 specific features and programs. Some of The Source's services provide detailed, regularly updated information, while others are highly interactive, such as electronic shopping. Still other services, like computer conferencing, are communications oriented. One of The Source's most popular features is its *SourceMail* electronic mail service.

Recently, The Source added another communications service—Special Interest Groups (SIGs). Among the SIGs offered are for IBM and Apple PC users, for users of Texas Instruments' TI-99/4 computers, and an SIG for lawyers.

The Source prides itself in being an easy-to-use service, intended for the general public and businesspeople and not information specialists (e.g., librarians). The Source reports over half of its users now access it for business purposes.

Competitive Position

The Source seems to be in the same position as ORBIT was before its acquisition by Pergamon. The subscriber base is stagnant (at under 70,000), and its menu of on-line offerings has not changed significantly over the past year. Yet, its competitors, notably CompuServe and the GE Network for Information Exchange (GEnie), are adding new services, gaining subscribers quickly, and winning praoactive reputations.

Right now, then, The Source is standing still, and we have to wonder what its new owners are waiting for. Spokesperson Nancy Beckman, however, reports changes are coming. Since Welsh, Carson, Anderson and Stowe acquired it in June 1987, The Source has been making strategic plans and organizing tasks.

There's been one tangible result, so far. The Source has been reorganized along business lines, focusing on its strongest products—communications, investor services, databases and publishing, and news and information. (Previously, The Source was organized into seven or eight

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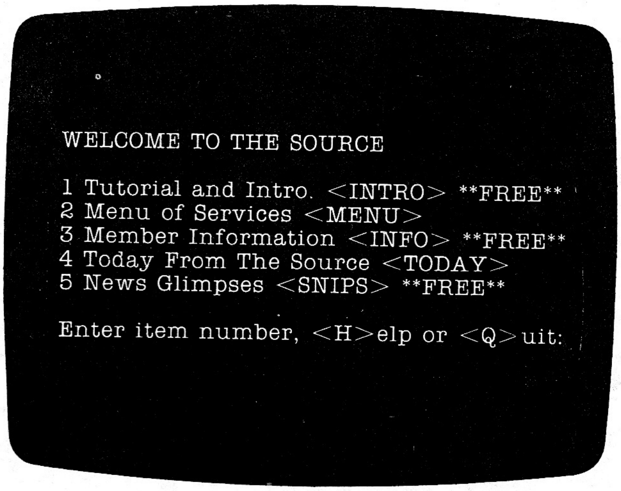


```
WELCOME TO THE SOURCE

1 Tutorial and Intro. <INTRO> **FREE**
2 Menu of Services <MENU>
3 Member Information <INFO> **FREE**
4 Today From The Source <TODAY>
5 News Glimpses <SNIPS> **FREE**

Enter item number, <H>elp or <Q>uit:
```

Figure 1. The Source's welcome screen is uncluttered but designed with new users in mind. To get a rundown of new services, users must choose option 4, "Today from The Source."

HANDS-ON EVALUATION

The Source calls itself "America's premier on-line service." We are not sure how the slogan writer was using "premier," but it was probably a good choice of words. The Source is certainly not the most comprehensive service of its type—CompuServe beats it easily. It's not the least costly—the General Electric Network for Information Exchange (GEnie) beats it there. And it's not the largest—both CompuServe and GEnie have more subscribers. So premier is probably a safe thing to say.

Users dial up The Source via the Telenet telecommunications network. We were disappointed to find The Source is not accessible through Tymnet. We often have problems with line noise when using Telenet, so when given a choice, we always opt for Tymnet. While WATS service is also available, it accommodates only 300 baud access.

Unlike some other services, The Source's welcome screen is sparse (Figure 1). It does not plug new services or promotions. Instead, it gives users the option of seeing announcements from The Source, viewing a tutorial or menu of services, or seeing news headlines. While that kind of welcome screen is fine for new users, experienced users may want news from the service right off.

From the main menu (Figure 2) users can move into any of The Source's nine categories of services. These categories include *Today from The Source*; *News, Weather, and Sports*; *Business and Investing*; *Communication Services*; *Special Interest Groups*; *Personal Computing*; *Travel Services*; *Education, Shopping, and Games;* and *Member Services.*

Like its competitors CompuServe and GEnie, The Source is strong in communications-related services. That category includes computer conferencing, electronic bulletin boards, and the SourceMail electronic mail service. The Source also offers Special Interest Groups (SIGs). A relative newcomer to this area, however, The Source's selection of SIGs is meager compared to CompuServe's or even GEnie's. Granted, The Source also offers "Professional Exchanges" (Figure 3), which it says "go beyond SIGs by focusing on professional development, idea sharing, decision support, and continuing education." But there are only three of those—Education Exchange, Legal Exchange, and the Word Perfect Exchange. Clearly this whole area needs broadening.

Areas in which The Source excels are in news and business information services. Indeed, if current awareness is a priority, then The Source is a good choice given its wide selection and relatively low access charges. In the news category (Figure 4), Source subscribers can access AP and UPI wire service stories, The *Washington Post*, the Scripps-Howard News Service, and feature stories from United Media. The Source also offers *Decisionlines*, a collection of 13 separate newsletters compiled by Gannett. Available through subscription only, categories include personal investing, banking and economy, energy, and insurance. A "special" newsletter compiles miscellaneous news stories and is free of charge.

Business information (Figure 5) is another Source plus. The Source offers realtime or delayed stock quotes from Standard & Poor's; historical price quotes; *Bizdate*, a daily business tabloid; a portfolio manager; an on-line brokerage service; and stock and commodity reports from *Unistox*, a service of UPI. Unistox offers such things as reports on New York Stock Exchange prices and bond

categories instead of those four.) While new products and services have not yet appeared, they are coming, says Beckman.

RESOURCES AND FACILITIES

Processing Center

Source Telecomputing Corporation maintains an access center in McLean, Virginia. The center houses 19 Prime 750 minicomputers, each with 3 million bytes of computing memory, and 19 disk drive units with a total of 5.7 billion bytes of storage memory. It is maintained 24 hours a day, year-round, by operating and programming personnel.

Systems Software

Source Telecomputing Corporation does not allow clients to access its systems software.

Customer Support Services

The STC computer center maintains a customer support department, providing services from 8 a.m. to 1 a.m. seven days a week. STC also provides its subscribers with easy-to-use manuals, plus free on-line assistance. The company's free on-line training consists of four 20-minute, interactive lessons. Each lesson covers a different service category (e.g., Communications, Investing).

Sales and Marketing Services

STC markets The Source through its home office in McLean, Virginia.

PROCESSING SERVICES

Pricing

Rates and fees for The Source are shown in Table 1 (Page OL20-840-105).

HANDS-ON EVALUATION (Continued)

prices. The Source's BIZDEX feature is a handy summary and index of all business and financial services offered.

General reference services are lacking. While The Source offers *Investext* for analysts' reports, and newswires and the like for current awareness, it offers nothing akin to CompuServe's IQUEST gateway. (IQUEST, CompuServe's version of EasyNet and InfoMaster, lets users tap into 900 databases.) The Source's only offerings under its General Business Reference category are the *Academic American Encyclopedia* (accessible on a subscription basis only) and the Probe Professional Information Services. Probe provides research services on a fee-paid basis from Information on Demand, an information broker.

Getting around The Source is easy, as it is both menu and command driven. Basic commands are mnemonic: M gets you to the main menu, Q to the command level (arrow), P to the previous menu. To navigate the system you can rely on the menus if you have infinite patience and money; or, you can speed to categories of interest by typing in subject categories, such as business.

Incidentally, we conducted this hands-on evaluation before we received our documentation, but had little difficulty. The Source is one of the few services in which you can get away with this, thanks in part to its extensive on-line help, including an extensive on-line tutorial (Figure 6) that lasts over an hour and is provided free of on-line charges. We commend The Source for this generous and effective use of the medium. The Source also has a toll-free customer support number.

One major complaint: When we tested the service it got hung up several times. The system froze twice, forcing us to log off and then log on again; or, we'd enter a menu option (say 2) and get a nonsensical response (e.g., f*). Eventually, we'd get the selected option. In general, response time was slow even at 2400 bps. (To be fair, CompuServe can be slow too. Consider its annoying "One moment please" that appears when a request for a new service requires the system to switch mainframes.)

As mentioned earlier, we had to go in through Telenet and thus contend with the line noise that plagues that network (or at least the node we usually use). Line noise especially concerned us when we downloaded a program from the Education Exchange. The procedure seemed to work out okay, although we don't know for certain since it was an archived file, and we did not have an "unarcing" program handy.

The Source probably has about the amount of usage and number of subscribers it deserves. It's not nearly as comprehensive a service as CompuServe although it certainly has its strengths. If The Source is the system you learned first, we can certainly understand why inveterate users may not care to stray. It offers games, business information, communications services, news—in short, everything you might want. If The Source does beef up its offerings, as it says it will, it has the potential to be the best service of its type.

APPLICATION-SPECIFIC SERVICES

Information Retrieval

STC provides an easy-to-use, menu-driven program that allows access to the service.

Electronic Mail

STC provides *SourceMail*, a sophisticated electronic message system that allows subscribers to communicate with each other with immediate delivery capability. Simple messages or lengthy reports can be transmitted quickly and economically. Other communications services include computer conferencing, Chat (keyboard-to-keyboard communicating), electronic bulletin boards, and a member directory.

Mailgram is another electronic mail system offered by The Source. It is a message service that allows users to send mailgrams conveniently from a microcomputer via The Source, while maintaining mailing lists. Mailgrams arrive the next business day. Mailgram recipients do not have to be members of The Source.

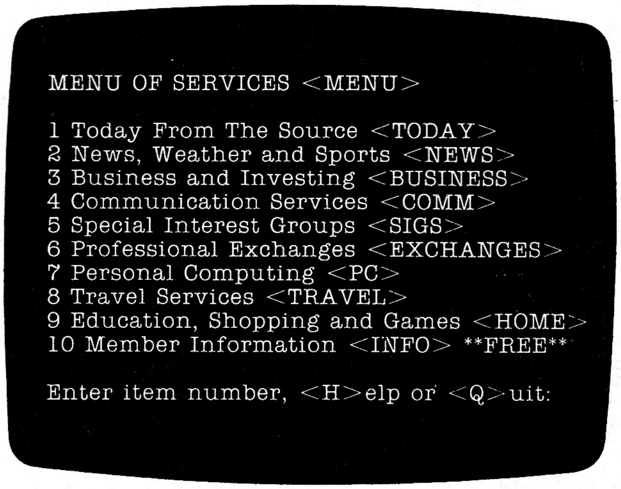
MICROCOMPUTER SOFTWARE/SERVICES

re:Source

re:Source is a combination of communications and script development software designed to make The Source easier to use. As a "front-end" system, re:Source speeds file transfers, automates frequent command sequences, and integrates database information for The Source. re:Source is supported by its own on-line Special Interest Group, where users can get answers to questions, exchange scripts with other users, download new versions directly from The Source, etc. It is priced at $89.

NETWORKING SERVICES

Access to The Source is available via the Telenet telecommunications network. STC also provides its own communications network, *Sourcenet*, which is available in several



```
MENU OF SERVICES <MENU>

1 Today From The Source <TODAY>
2 News, Weather and Sports <NEWS>
3 Business and Investing <BUSINESS>
4 Communication Services <COMM>
5 Special Interest Groups <SIGS>
6 Professional Exchanges <EXCHANGES>
7 Personal Computing <PC>
8 Travel Services <TRAVEL>
9 Education, Shopping and Games <HOME>
10 Member Information <INFO> **FREE**

Enter item number, <H>elp or <Q>uit:
```

Figure 2. The Source's main menu, option 2 from the welcome screen.

major metropolitan cities. In addition, subscribers in outlying regions may access The Source via WATS lines at a reasonable surcharge. Almost any terminal that meets the following criteria can be used:

- 300, 1200, or 2400 (in selected cities) bits per second
- No parity
- 8-bit ASCII code
- 1 stop bit

ON-LINE DATABASES

The following are key on-line services and databases available via The Source.

Today from The Source

A compilation of news stories, selected and updated by The Source. All the following services are updated continuously, except for *Focus*, which is updated daily, and *New*, which is updated throughout the week.

Hour's Top News (Bulletin)—the latest news, provided in both summary and detail. Regular features include News-at-a-Glance, Today in Congress, and Opinion Forum.

Business Update (Bizdate)—current business and investment information compiled by The Source newsroom from a variety of sources. Key areas in which news is offered include Market Indicators, Currency, Financial News, Economic Reports, Mergers and Acquisitions, Investment Tips, and Commodities Indexes.

Sports News (Sports)—current sports news, scores, commentary, and features, compiled by The Source.

Ski Reports (Ski)—available through the ski season, December through March, this service provides daily updates on slope conditions throughout the U.S.

Today's Features (Focus)—facts and trivia; television news and movie highlights and critiques; horoscopes; trends; and features on show business personalities and other celebrities.

What's New (New)—a regularly updated listing of news about The Source, including announcements of new services, information about special promotions and discounts, and changes to existing services.

What's New in Member Publishing (Public 8)—information on the latest news in member publishing.

News, Weather, and Sports

United Press International (UPI)—provides the latest news before it's printed. UPI sports and news are on-line within minutes after release. A keyword search capability permits users to extract stories of specific interest from news events happening anywhere in the world.

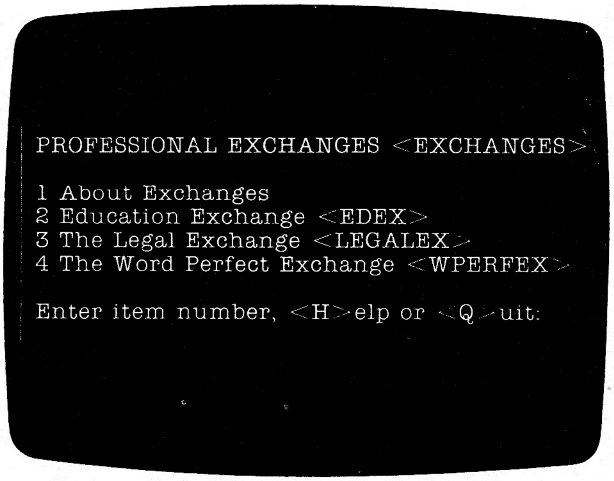
Associated Press (AP)—keyword-searchable electronic edition of the AP newswire. Several hundred stories are specially selected by AP each day in categories ranging from "News Brief" and "World News" to "Business & Finance" and "Entertainment & Sports."

The Washington Post (WP)—keyword-searchable electronic edition of selected sections from the Monday to Friday editions of *The Washington Post.*

Scripps-Howard News Service (SHNS)—a keyword-searchable database of the last seven day's stories, provided by publications ranging from the *Providence Journal* and *Technology Illustrated* to *Science News* and the *Detroit News.*

Accu-Weather (Weather)—domestic and international weather conditions and forecasts provided by Accu-Weather.

United Media Features (Bylines)—nearly 75 columns and features including Judith Martin's "Miss Manners" and Jack Anderson's "Washington Merry-Go-Round."



```
PROFESSIONAL EXCHANGES <EXCHANGES>

1 About Exchanges
2 Education Exchange <EDEX>
3 The Legal Exchange <LEGALEX>
4 The Word Perfect Exchange <WPERFEX>

Enter item number, <H>elp or <Q>uit:
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Figure 3. Professional Exchanges, Special Interest Groups geared to professionals, are a new Source feature. As of mid-June 1988, three such exchanges were available.

Source Telecomputing Corporation (STC)

Hours of Operations

The Source's services are available 24 hours a day, 7 days a week.

Prime Time . . . 7 a.m. to 6 p.m. Monday-Friday

Non-Prime Times . . . 6 p.m. to 7 a.m. Monday-Friday. All day Saturday, Sunday, and Holidays (New Year's Day, July 4th, Labor Day, Thankgiving Day, and Christmas Day)

The Source may be temporarily unavailable due to maintenance between 4-6 a.m. Eastern time. For areas without daylight saving time: from the first Sunday of April to the last Sunday of October, Prime Time hours are 6 a.m. to 5 p.m

Registration

There is a onetime registration fee of $29.95, plus $3.50 postage/handling in the U.S. and Canada. ($15 postage/handling outside the U.S. and Canada)

Monthly Membership

There is a $10 monthly Membership Fee credited toward monthly usage of The Source. There are no monthly storage or account maintenance minimum fees.

Members may opt to pay a $95 Annual Membership Fee rather than the $10 monthly fee, thereby saving $25. For details on the Annual Membership Fee offer, type RATES at Command Level.

Storage

Storage charges are calculated by number of records. One record equals about 2,048 characters. Monthly storage charges are between $0.05 and $0.50 per record, depending on the number or records stored.

Charges for storage of records on The Source may be viewed by typing RATES at Command Level.

Free On-line Services

Certain services on The Source are available to members free of on-line charges. These are noted on-line and in documentation and include the Tutorial (TUTOR); Member information (INFO); Introduction (INTRO); and Billing and Usage Information (DETAIL).

Value-Added Services

For some special services, The Source may charge a higher per-minute or an additional transactional fee. These fees will be clearly noted on-line and in the print documentation for those services. Users may review value-added service pricing by typing RATES at Command Level or by calling The Source at (800) 336-3366.

Basic Usage

The Source Usage Cost/Minute	300 Baud ($)	1200 Baud ($)	2400 Baud ($)
Basic Services			
Prime Time	0.36	0.43	0.46
Non-Prime Time	0.14	0.18	0.20

Special Interest Groups (SIGs)

These rates apply when accessing any of the Special Interest Groups Services available on The Source (indicated on-line by*).

Prime Time	0.18	0.23	0.25
Non-Prime Time	0.10	0.13	0.15

Users are charged only for the time they are actually on-line with The Source. All rates are charged per minute. Each total on-line session is rounded up to the nearest minute and calculated as of the local time at the user's billing address. Rates include telecommunications fees from more than 1,200 local calling areas. Incoming WATS lines are available at a $0.25 per-minute surcharge above all fees. For specific per-minute pricing for value-added services and pricing for Alaskan, Canadian, and Hawaiian members, please refer to the free on-line service RATES. (Type RATES at Command Level.) Overseas members are responsible for telecommunications fees to the U.S.

Table 1. Rates and fees for The Source in the continental U.S.

News Indexed by Subject (Newsdex)—an index of all services.

Communications

Multi-user Messaging (Chat)—a realtime messaging service providing both private and public keyboard "conversations" among two or more subscribers.

Participate Conferencing (Parti)—an on-line conferencing system providing both private and public conferences.

Members Directory (Members)—a keyword-searchable directory offering profiles of members of The Source.

Mailgram Message Service (Mgram)—a hard copy mailgram message delivery service for addresses in the U.S. and Canada.

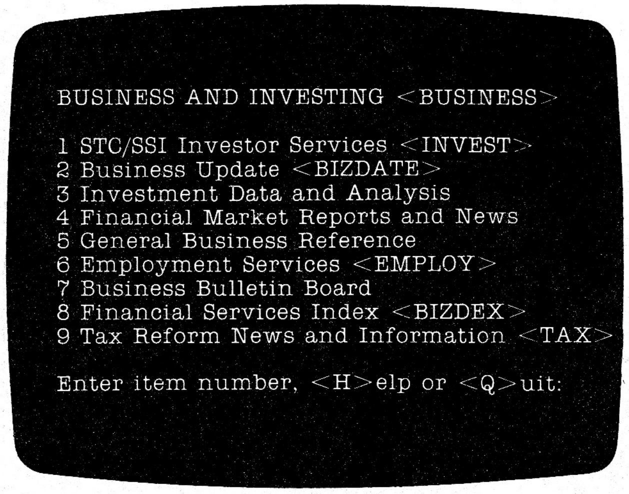
Education, Shopping, and Games

Grolier's Encyclopedia—a full-fledged electronic encyclopedia, updated quarterly. Searching via keywords is possible through single or multiple volumes.

Comp-U-Store (Cstore)—an electronic department store service for shopping at home for over 50,000 brand name items. Subscribers can comparison shop by product, manufacturer, model number, and product characteristics, as well as by price.

Games (Games)—electronic games ranging from Adventure to "Star Trek," to word games like Hangman to Mastermind.

Movie Reviews (Movies)—mini movie reviews for thousands of movies, including major motion pictures currently playing at all theatres, on television, and on videodisk or cassette.



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BUSINESS AND INVESTING <BUSINESS>

1 STC/SSI Investor Services <INVEST>
2 Business Update <BIZDATE>
3 Investment Data and Analysis
4 Financial Market Reports and News
5 General Business Reference
6 Employment Services <EMPLOY>
7 Business Bulletin Board
8 Financial Services Index <BIZDEX>
9 Tax Reform News and Information <TAX>

Enter item number, <H>elp or <Q>uit:
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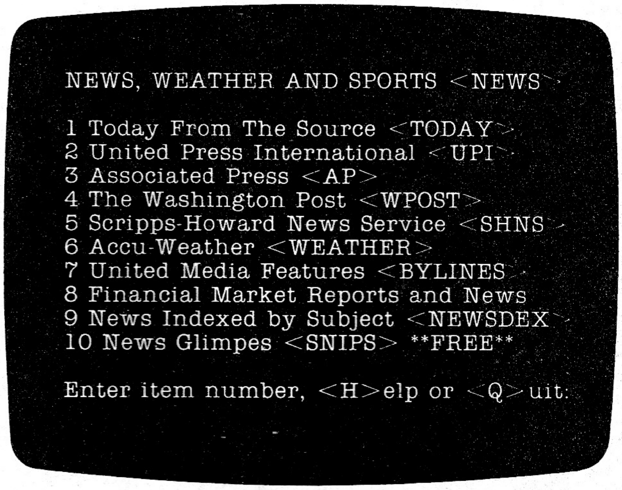
Figure 5. The Source's menu of business-related services, shown here, keeps expanding, broadening the service's appeal to the business community.



```
NEWS, WEATHER AND SPORTS <NEWS>

1 Today From The Source <TODAY>
2 United Press International <UPI>
3 Associated Press <AP>
4 The Washington Post <WPOST>
5 Scripps-Howard News Service <SHNS>
6 Accu-Weather <WEATHER>
7 United Media Features <BYLINES>
8 Financial Market Reports and News
9 News Indexed by Subject <NEWSDEX>
10 News Glimpes <SNIPS> **FREE**

Enter item number, <H>elp or <Q>uit:
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Figure 4. The main menu from the "news" category of sources available on The Source.

Professional Book Center (Books)—an on-line book ordering service specializing in scientific in-print books published or distributed in the U.S.

Music Purchasing (Music)—a discount mail order service for current and hard-to-find albums, cassettes, and compact disks.

Computer Express (Public 314)—discount merchandisers of computer software, hardware, and accessories.

Business and Investing

Commodity World News (CWN)—this service tracks price movements in commodities futures markets and provides market commentary as well as commodity news with frequent updates while the market is trading.

Investext Company and Industry Reports (Investext)—provides corporate and research reports from more than 40 of the world's leading investment brokerage firms. Reports include financial analysis as well as commentary and investment advice. More than 3,000 companies, 50 industries, and 1,000 products are included.

STC/SSI Investor Services (Invest)—a set of investment tools including stock and option quotes, automated portfolio management, on-line trading, financial market reports and analyses, and business and investment news.

Standard & Poor's Quotes and Prices (Invest1)—provides stock quotes (with P/E ratio, open, high, low, last price, change, and volume), market index quotes, and company financial data.

Portfolio Manager (Invest 2)—an automated system for tracking both real or hypothetical portfolios. Either real-time or delayed quotes can be used to display current holding values automatically, and a summary of all on-line trading is provided.

Source Telecomputing Corporation (STC)

Online Trading (Invest 3)—trades can be entered 24 hours per day and are executed by Spear Securities, Inc., within as little as two minutes if the markets are open, or the next business day if the markets are closed.

Information about Trading Online (Invest 4)—a detailed explanation of Spear Securities on-line trading service and information regarding the realtime trading service.

Historical Quotes (HQ)—gives data going back as far as 24 years for NYSE and AMEX stocks, NASDAQ stocks, options, NYSE and AMEX bonds, mutual and money funds, government issues, commodities, indices, Standard & Poor's industry groups, and security statistics.

Media General Inc.'s Stock Analysis (Stockvue)—provides dozens of historical stock analysis tools such as price/earnings ratio, periodic price change, relative price/action, trading volume, trend to market, and price range for more than 4,300 common stocks.

Risk/Reward Analysis (Profiteer)—decision support tool providing risk/reward analysis for stocks, bonds, warrants, and convertibles.

Donoghue Money Letter (Donoghue)—weekly commentary on topics ranging from money market and mutual funds to banking and retirement options, plus information on investment opportunities in gold, IRAs, etc.

Market Reports (Unistox)—stock and commodity reports from the UPI financial wire. More than 200 individual reports are available; update schedules vary from daily to weekly.

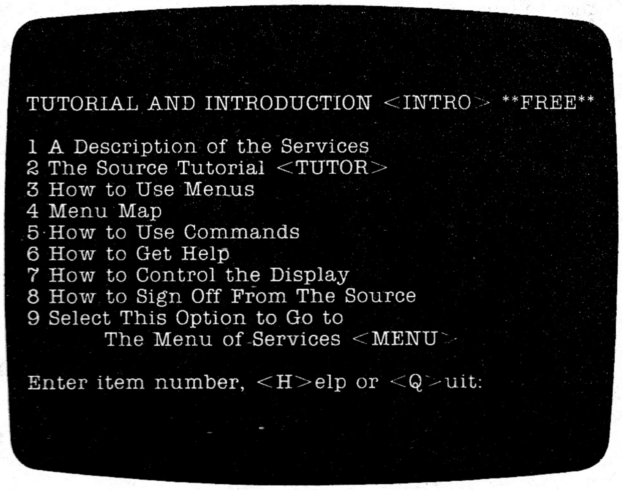
CDA Mutual Fund Analyses (CDA)—provides performance histories of nearly 1,000 mutual funds and 40 different market indices.

Vestor Stock Evaluations and Screenings (Vestor)—screens 6,000 stocks to find those meeting your criteria; analyzes stocks and makes predictions; offers computer-based recommendations of 5 stocks that are the best buys of the week.

UPI Business Wire *(UPI N B)*—UPI's up-to-the minute national business wire, from which the user can select news on a wide range of topics by entering up to three keywords.

Currency (Bizdate 4)—provides daily closing spot exchange rates for 35 currencies; daily New York money market rates for prime, commercial paper, broker loan rates, bankers acceptances, treasury bills, eurodollar rates for 9 currencies, and CDs; and a daily newsletter.

Employment Service (Employ)—an on-line listing of both job candidates and jobs available in 40 industry categories.



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TUTORIAL AND INTRODUCTION <INTRO> **FREE**

1 A Description of the Services
2 The Source Tutorial <TUTOR>
3 How to Use Menus
4 Menu Map
5 How to Use Commands
6 How to Get Help
7 How to Control the Display
8 How to Sign Off From The Source
9 Select This Option to Go to
      The Menu of Services <MENU>

Enter item number, <H>elp or <Q>uit:
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Figure 6. The Source offers a free on-line tutorial.

Professional Information Services (Probe)—a research service provided by Information on Demand.

Personal Computing

Microsearch (Microsearch)—a buyer's guide with product literature from more than 6,300 manufacturers and abstracts of product reviews from more than 200 publications.

Computer Industry News (Newsbytes)—a computer newsweekly with information on new products, technological breakthroughs, and corporate happenings.

The Microcomputer Monitor (Dvorak)—an electronic edition of columnist John Dvorak's observations of the microcomputer industry.

Travel Services

Airline Schedules and Fares (OAG)—the Official Airline Guide Electronic Edition provides objective rate information and schedules for nearly 750 airlines, plus national and international hotel listings.

Mobil Hotel Guide (USRoom)—quality star rating system provided by Mobil Oil Corporation for 16,000 accommodations in the continental U.S. and Canada.

Mobil Restaurant Guide (USRest)—quality star rating system provided by Mobil Oil Corporation for 6,000 restaurants in 1,600 cities in the continental U.S. and Canada.

ABC Online Travel Service (ABC)—international listing of 20,000 hotel accommodations searchable by any of 24 keywords.

Private Network Services

The Source's Private Network Services product is designed for associations and other organizations seeking a

▷ communications link to and from their members or customers. A Private Network may include newsletters; bulletin boards; electronic surveying of members; a directory of members; and on-line ordering of publications, products, and services. Services from The Source, such as *SourceMail*, electronic conferencing, UPI news, etc., can also be incorporated into a Private Network offering. Users access a Private Network via any modem-equipped personal computer.

A Private Network can support several hundred to several thousand users. The Private Network package, including software consultation, on-site training, documentation, and continued sponsor support, costs $5,000. There are no additional monthly minimum fees for the sponsor; Private Network users are charged as little as $0.14 per minute.

FUTURE PLANS

Source Telecomputing Corporation plans to continue expanding its services of interest to corporate users, providing easier access to its databases, and developing additional methods for managing the information available. □

Standard & Poor's Compustat Services, Inc.

COMPANY INFORMATION

Standard & Poor's Compustat Services, Inc. (SPCS)
7400 S. Alton Court
Englewood, Colorado 80112 (303) 771-6510

UPDATE: *Standard & Poor's Compustat Services, Inc. (SPCS) has increased the number of companies covered by its Compustat databases. It is also moving beyond its traditional target market, the financial community, to other users such as the academic community. Finally, the company has broadened its CD-ROM product line with the addition of Compustat PC Plus Corporate Text, a database of company reports providing the full text of annual reports and 10Ks, 10Qs, and Proxy Statements.*

Company Background

Standard & Poor's Compustat Services, Inc. (SPCS), a McGraw-Hill Financial Services Company, has been a leading source of fundamental financial information for the business and financial communities for over 25 years. SPCS offers a number of services including Compustat, a computerized research and analysis database of fundamental, market, and product line data describing thousands of corporations.

The Compustat databases are valuable tools for the following applications:

- Securities analysis
- Merger and acquisition studies
- Corporate planning
- General economic planning and research
- Credit analysis
- Pension fund management
- Portfolio management
- Investor relations

Competitive Position

SPCS has been a leading supplier of fundamental financial, statistical, and market data for publicly held companies since 1962. SPCS claims such features as accuracy, extensiveness, timeliness, standardization, and support are contributors to the success of its Compustat databases. While there are other electronic sources of information (e.g., *Disclosure, Valueline, Moody's*), SPCS feels its Compustat files provide more extensive coverage of data depth and history. SPCS has another advantage in its favor—the Standard & Poor's name, which is synonymous with authoritative investment information.

Standard & Poor's Compustat Services, Inc. (SPCS), a subsidiary of the Standard & Poor's Corporation, has produced its comprehensive Compustat financial and statistical databases since 1962. These databases, standardized to make comparisons more valid, provide information on approximately 7,200 publicly held companies.

SPCS offers Compustat databases through several distributors, all of which provide clients with several system options. Users can also load Compustat directly onto their in-house systems via tapes and Compustat is also available in a format for immediate use on personal computers. In addition, CD-ROM products are available that contain all of the Compustat databases.

REPORT HIGHLIGHTS: PAGE

Compustat PC Plus 102
On-Line Databases 102

RESOURCES AND FACILITIES

Data Sources

The Compustat databases of corporation, banks, and utilities are compiled using 10Ks, 10Qs, shareholder reports, press releases, and daily news services for over 7,200 publicly held companies that file with the Securities and Exchange Commission.

SPCS' GLOBAL Vantage database is a unique offering of annual data on thousands of international companies and available through a joint venture with Extel Financial Services, a leading U.K.-based supplier of foreign company information.

The Compustat PC Plus Corporate Text product is a full-text, software and database offering 10Ks, 10Qs, Proxy Statements, and Annual Reports in their entirety on compact disk. This database is available through a distribution arrangement with SEC Online, Inc.

Distribution

SPCS products are available on CD-ROM, magnetic tape, and through third-party distributors, updated weekly or monthly.

▷

Standard & Poor's Compustat Services, Inc.

Customer Sales and Support

SPCS maintains offices in Englewood, Colorado; New York, New York; and London, England.

Subscribers to the Compustat products have access to a toll-free support hot line for assistance with data and software questions. Account representatives are available to assist clients in the effective use of Compustat products in analytical and research functions.

Applications

SPCS products are used by investment managers, security analysts, corporate planners, research and information directors, and other professionals for such purposes as:

- Merger and acquisition analysis
- Investment studies
- Competitive analysis
- Portfolio management
- Credit analysis
- Financial modeling
- Peer group studies
- Research activities

NETWORKING SERVICES

The products available from SPCS on CD-ROM can be installed on a local area network for simultaneous access to the databases and software. The products will operate with NETBIOS-compatible networks such as Novell, Banyan, 3Com, and IBM LAN Manager.

MICROCOMPUTER/SOFTWARE SERVICES

Compustat PC Plus

Compustat PC Plus combines the Compustat databases with superior analytical software on compact disc. The databases available are:

- 7,200 publicly traded corporations
- 5,200 inactive companies
- 14,000 product lines or business segments
- 275 industry composites
- 120 Standard & Poor's Industry Indexes
- User-defined databases of companies, items, and equations
- Daily stock prices
- Earnings estimates from Lynch, Jones & Ryan

Some of the software features that rival mainframe capabilities are:

- Screen on any variable or combination of variables, across any time period, across all databases
- Save and modify screening criteria
- Access annual, quarterly, monthly, and daily data in a single application
- Generate presentation-quality reports
- Create any one of over 60 standard reports from the PC Plus Report Library
- Add user-defined companies and data, then merge them with PC Plus
- Link the data and software features with Lotus 1-2-3
- Download in ASCII to link with graphics or spreadsheet software

Compustat PC Plus Corporate Text

Corporate Text is a database and software product of complete company reports on compact disk. The full text of Annual Reports, 10Ks, 10Qs, and Proxy Statements can be searched for the section, page, or document the user wishes to analyze. For the first time on CD, the user can access this database of documents word for word and review:

- Letter to Shareholders
- Management Discussion and Analysis
- Pension and Retirement Plans
- Directors' Biographies
- Stock Ownership
- Components of Debt Outstanding

Corporate Text is comprised of documents filed since July 1987 by New York and American Stock Exchange companies.

ON-LINE DATABASES

Compustat—a set of databases that contains fundamental financial and statistical information on approximately 7,200 publicly held U.S. and some non-U.S. corporations. The databases include the following information:

- Income statement
- Balance sheet
- Statement of cash flows
- Supplemental income statement and balance sheet items
- Operating statistics
- Line of business data
- Market-related data
- Select restated data for income and balance sheet accounts

The information in the database comes from a variety of sources, including:

- Company annual and quarterly reports
- Securities and Exchange Commission (SEC) 10K and 10Q reports
- Government reports
- Uniform Statistical Reports

Standard & Poor's Compustat Services, Inc.

- Daily news services
- Direct company contacts

The Compustat database is divided into three major classifications: Industrial, Bank, and Utility-Telecommunications:

Industrial-File—a database containing information on industrial companies. This database is further broken down into seven subsections, containing annual data for up to 20 years and quarterly data for up to 12 years.

The *Primary Industrial File* contains:

- 304 annual data items
- 111 quarterly data items
- Information on approximately 800 major New York Stock Exchange, American Stock Exchange, and Over-the-Counter companies
- All companies in the Standard & Poor's Industrial Index

The *Supplementary File* contains:

- 304 annual data items
- 111 quarterly data items
- Information on approximately 800 New York Stock Exchange and American Stock Exchange companies

The *Tertiary Industrial File* contains:

- 304 annual data items
- 111 quarterly data items
- Information on approximately 700 companies that complete the New York Stock Exchange and American Stock Exchange industrials when added to the Primary File and Supplementary File
- Information on more than 100 nonindustrial companies that complete coverage of the Standard & Poor's 500 when added to the Primary File

The *Full Coverage File* contains:

- 304 annual data items
- 111 quarterly data items
- Information on approximately 4,700 companies from the NASDAQ and Over-the-Counter list

The *Canadian File* contains:

- 77 annual data items
- Information on approximately 450 leading Canadian industrial companies

The *Business Information File*—enables users to identify and analyze products for approximately 6,800 companies. Each company is assigned up to 90 SIC codes, identifying all products manufactured or major services furnished by the company.

The *Business Information File*—also contains business and geographic segment data. Data for a company may include a maximum of 10 business segment descriptions, which contain:

- Financial data items for each segment
- SIC codes for the segment
- Principal products for the segment
- Principal customers for the segment

A company's description in the Business Information File may also include up to four geographic segments, providing financial information on the company's operations in particular foreign geographic areas.

Bank File—provides up to 20 years of annual data and up to 12 years of quarterly data.

The *Bank File* contains:

- 224 annual data items
- 147 quarterly data items
- Information on about 150 leading U.S. banks and bank holding companies

Utility File—provides up to 20 years of annual data and up to 12 years of quarterly data on:

- Electric utilities
- Gas distribution companies
- Electric and gas combination companies
- Natural gas transmission companies
- Electric and gas subsidiaries of major utility holding companies

The *Utility File* contains:

- 472 annual and 20 period descriptor data items
- 200 quarterly data items
- Information on approximately 340 Class A gas, electric, and water utilities and subsidiaries

The primary users of the *Utility File* are the utility industry, state and federal regulatory agencies, management consultants, and the banking and financial communities.

Telecommunications File—a special database restricted to coverage of the telecommunications industry and intended for in-depth study of that industry. The primary users of this database are the telephone industry, state and federal regulatory agencies, management consultants, and the banking and financial communities. The database provides information on approximately 100 telephone companies and subsidiaries of major telephone holding companies filing with the SEC and contains:

- 372 annual and 18 period descriptor data items
- 165 quarterly data items

Standard & Poor's Compustat Services, Inc.

▷ The information in the database includes:

- Income statement accounts
- Balance sheet accounts
- Statement of changes in financial position accounts
- Supplementary income statement and balance sheet accounts
- Operating statistics
- Market-related data

Prices/Dividends/Earnings (PDS) File—a special Compustat file covering 7,200 industrial and nonindustrial companies. The *PDE File* provides:

- 10 key market items
- 115 indices, including:

—Standard & Poor's Industrials
—Standard & Poor's 500
—Standard & Poor's Over-the-Counter 250
—Dow Jones 30 Industrials
—Dow Jones 20 Transportation
—Dow Jones 15 Utilities
—ASE, NYSE, and NASDAQ indices
—NASDAQ National Market
—105 Standard & Poor's Industry indices

The *Industrial Research File*—provides up to 20 years of data for 304 annual items on over 5,200 industrial companies deleted from the Compustat files. These companies no longer file with the SEC because of bankruptcy, liquidation, merger, or acquisition.

The *Annual and Quarterly Aggregate Files*—contains composite financial and market data on approximately 275 Compustat aggregate industry groups.

OTHER SERVICES

SPCS supplies comprehensive manuals to all subscribers, describing, in detail, the content and technical aspects of the Compustat services.

SPCS also publishes the weekly Compustat Status Report, containing a list of all companies in the Compustat files. This publication is sent to all subscribers.

Subscribers to the specialized files—PDE, Aggregate, and Industrial Research— all receive the Specialized Files Status Report monthly.

SPCS will, on request, produce customized analytical reports in a variety of formats, including hard copy.

FUTURE PLANS

SPCS reports that it plans to continue developing innovative responses to the changing information needs of the financial, academic, and investment communities. ☐

Telenet Communications Corporation

COMPANY INFORMATION

Telenet Communications Corporation
12490 Sunrise Valley Drive
Reston, VA 22096
Telephone (703) 689-6000

Company Background

Telenet, founded in 1972, initiated its first public data network service in 1975 through a seven-city network. Today, Telenet Communications Corporation offers public dial-in, private dial-in, and dedicated packet switched data communications services for approximately 18,000 local exchanges and more than 70 international locations.

Telenet Communications Corporation is a division of US Sprint, which is owned jointly by GTE Corporation and United Telecommunications, Inc. (UTI). The US Sprint joint venture began on July 1, 1986, and combines the long-distance voice and data operations of GTE and United Telecommunications. As a result of the joint venture, Telenet's operations have merged with those of Uninet, formerly the data communications business of UTI.

Telenet's public packet switched network is used by a variety of business facets, including insurance agencies, petroleum refineries, banking institutions, computer service bureaus (for interactive time-sharing and remote batch processing), and health and educational services. The public network also provides data communications services to federal and state agencies, wholesale and retail businesses, hotels, recreational services, and agricultural industries, among others. Applications accommodated by Telenet include the following:

- Interactive data processing
- Database management
- Transaction processing and credit verification
- Sales forecasting
- Market research
- Electronic funds transfer
- Inventory control
- Insurance claim processing
- Electronic mail
- Order entry
- Public database access
- Cash management

Telenet Communications Corporation (a US Sprint company) operates Telenet, one of the world's largest public packet-switching networks. Telenet combines the resources of the former GTE Telenet and Uninet public data networks. The network now serves approximately 18,000 local exchange areas in the U.S. and 70 foreign countries.

The Telenet network accommodates a diversity of computer-based applications including time-sharing, text editing, financial management, data retrieval, and transaction management. Telenet also designs and installs dedicated networks for large organizations, multinational corporations, and the telecommunications agencies of other countries.

Telenet also offers value-added services accessible via the public data network. *Telemail*, an electronic mail system introduced in 1980, allows users to send and receive messages, regardless of time zone or user availability. In 1986, Telenet acquired a 60 percent interest in Consortium Communications, Inc., a telex firm, enabling users to send and receive telexes via telemail. Telenet offers *Micro-Fone*, a data terminal for retail applications. Micro-Fone allows merchants to verify credit or check validity within 20 seconds. Through the Telecard service, Telenet offers full data capture services for banks and retail services.

Telenet International provides networking services in over 70 countries, including direct connections to Canada (through Datapac and TeleGlobe), Mexico (through Telepac), Puerto Rico, and the United Kingdom. Telenet also provides for interconnection with IRCs (International Record Carriers) that furnish data transmission to 43 other countries.

Competitive Position

Thanks to its recent merger with Uninet, Telenet now operates the largest public data network in the U.S. The company has installed more private packet switching networks than any of its competitors, which include AT&T's Accunet, ADP Autonet, CompuServe Network Services, Graphnet Freedom Network, GEISCO's MarkNet Service, the IBM Information Network, RCA Cylix, and Tymnet. Its public network is designed to adaptively route traffic and avoid network problems, thereby ensuring that the network operates smoothly. Redundant equipment and standby power supplies create a reliable network with virtually no downtime.

Fueled by the phenomenal growth in personal computers, usage of public packet switched data networks has increased. The introduction of a number of new products and services has helped Telenet to expand its network, which at the end of 1986 served more than 18,000 local exchange areas in the U.S. New products include higher speed (2400 bps) dial-in access, increased support for IBM protocols, and X.25 dial-in service.

The company's Telemail electronic mail service is described as one of the most fully featured and extensive electronic messaging networks in the world. Some of its features include hard copy business letter and overnight delivery options, two-way communications between Telemail and telex, and a new capability to directly connect independent Telemail systems in countries outside the U.S.

In 1986, Telemail was connected to Envoy-100 (Telecom Canada's electronic mail service) by means of an X.400-based interface.

RESOURCES AND FACILITIES

Control Center

Telenet's Network Control Center (NCC) continually monitors the status of the entire network, including related subscriber equipment and lines. From this central point, the NCC staff can oversee network availability, reliability, and volume (traffic levels); diagnose equipment problems at the customer's site; and, if necessary, initiate corrective action through remote software control of network processors and communications lines. The NCC also collects detailed statistical and accounting data for billing purposes.

Customer Support Services

Telenet's Customer Services Group is available around the clock, and can be reached by a toll-free telephone number to assist a user's data processing staff. Once a problem has been identified, Customer Services can pinpoint and resolve it, or dispatch a field engineer to the site.

A special synchronous support desk supports users of IBM SNA and SDLC equipment. Telenet also provides a series of seminars to help customers maximize the capabilities of their dedicated networks.

Sales and Marketing Services

Telenet maintains sales offices in major cities across the country. Sales representatives and systems engineers are available 24 hours a day for communications planning and technical consultation. Internationally, Telenet's chain of distributors provides installation and maintenance services to customers with multinational communications systems.

SERVICE LOCATIONS

The Telenet Public Network consists of high-speed transmission facilities interconnected by switching centers located in major U.S. cities. These centers, also known as Telenet Access Centers, handle terminal and host connections, tie in remote access localities, and route data to its destination.

Telenet Central Offices provide access to the Telenet network via dial-in ports and Dedicated Access Facilities (DAFs). The TCOs are classified as high-density City Class A, medium-density City Class B, or low-density City Class C, according to data traffic, for differentiating dial-in access charges.

Dial-in ports can access the Telenet network in all City Classes up to 1200 bits per second (bps). Currently, 2400 bps asynchronous service with optional local error protection is available in over 100 cities.

Telenet also provides data transmission services to the following countries:

Antigua
Argentina*
Australia*
Austria
Bahamas
Bahrain
Barbados
Belgium
Bermuda*
Brazil
Canada*
Chile*
China, P.R.
Colombia
Costa Rica
Curacao/Neth. Antilles
Denmark
Dominican Republic*
Egypt
Finland
France*
French Antilles
French Guyana
French Polynesia
Gabon
Germany, F.R.*
Greece
Guam
Guatemala
Honduras
Hong Kong*
Hungary (via Austria)
Iceland
Indonesia
Iraq (via Bahrain)
Ireland
Israel*
Italy*
Ivory Coast
Jamaica
Japan*
Jordon (via Bahrain)
Korea
Kuwait (via Bahrain)
Luxembourg
Malaysia*
Mexico*
The Netherlands
New Zealand
Norway*
Panama*
Peru
Philippines*
Portugal
Puerto Rico*
Qatar (via Bahrain)
Reunion Islands
Saudi Arabia (via Bahrain)
Singapore*
South Africa
Spain*
Sudan (via Bahrain)
Sweden
Switzerland
Taiwan
Thailand
Trinidad and Tobago
Turkey*
United Arab Emirates
United Kingdom*
Virgin Islands

**Telenet has a direct connection from its network to the networks in these countries. Telenet provides access to the remaining countries through interconnections with other international record carriers.*

NETWORK DESCRIPTION

The Telenet network, a fourth-generation network, is free-standing and can switch independently between hosts, support various protocols, and efficiently use available bandwidths.

The network's ability to convert speeds, protocols, and codes lies in the TP3000 and TP4000 microprocessors specifically designed for packet switching. These concentrators convert data into X.25 and support a variety of other communications protocols, such as SDLC, 3270, and 2780/3780, as well as protocol conversion. The 3270 network

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TELENET'S U.S. ACCESS TELEPHONE NUMBERS

	State Access Center		300/1200 bps	2400 bps	Class
Alabama					
205	Birmingham		328-2310	251-1885	B
205	Florence		767-7960		B
		Sheffield			
205	Huntsville		539-2281		B
		Madison			
205	Mobile		432-1680	438-6881	B
205	Montgomery		269-0090		B
205	Tuscaloosa		345-2077		C
Alaska[1]					
907	Anchorage		258-7222		
907	Barrow		852-2425		
907	Bethel		543-2411		
907	Cold Bay		539-2371		
907	Cordova		424-3744		
907	Deadhorse		659-2777		
907	Delta Junction		895-5070		
907	Dillingham		842-2688		
907	Fairbanks		456-3282		
907	Glennallen		822-5231		
907	Homer		235-5239		
907	Iliamna		571-1364		
907	Juneau		789-7009		
907	Ketchikan		225-1871		
907	King Salmon		246-3049		
907	Kodiak		486-4061		
907	Kotzebue		442-2602		
907	McGrath		524-3256		
907	Nome		443-2256		
907	Northway		778-2301		
907	Palmer/Wasilla		745-0200		
907	Prudhoe Bay		659-2777		
907	Seward		224-3126		
907	Sitka		747-5887		
907	Soldotna/Kenai		262-1990		
907	St. Paul		546-2320		
907	Talkeetna		733-2227		
907	Tanana		366-7167	(300 bps only)	
907	Valdez		835-4987		
907	Whittier		472-2467		
907	Yakutat		784-3453		
Arizona					
602	Phoenix		254-0244	256-6955	A
		Glendale			
		Scottsdale			
602	Tucson		747-0107		B
Arkansas					
501	Fort Smith		782-2852		C
501	Little Rock		372-4616		B
California					
805	Bakersfield		327-8146		B
714	Colton		824-9000		B
		Fontana			
		Rialto			
		Riverside			
		San Bernardino			

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[1] *Access is provided by Alascom, Inc.*

Table 1. Telenet's Dial Access Service telephone numbers as of fall 1986.

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	State Access Center		300/1200 bps		2400 bps	Class
213	Compton		516-1007			C
		Downey		Redondo Beach		
		El Segundo		Torrance		
		Hawthorne				
415	Concord		827-3960		674-0127	C
		Lafayette				
		Walnut Creek				
619	Escondido		741-7756			B
		San Marcos				
		Vista				
209	Fresno		233-0961			B
		Clovis				
714	Garden Grove		898-9820		895-1207	B
		Anaheim				
		Buena Park				
		Cypress				
		Fullerton				
		Huntington Beach				
818	Glendale		507-0909		246-3886	B
		Alhambra		Pasadena		
		Beverly Hills		Sun Valley		
		Burbank				
415	Hayward		881-1382			B
		Danville				
		Union City				
213	Los Angeles		937-3580 or 624-2251		622-1138	A
		Culver City		Pasadena		
		Hollywood		Santa Monica		
		Inglewood		Van Nuys		
213	Marina Del Ray		306-2984		823-0173	B
		Mar Vista				
		Santa Monica				
		Sun Valley				
209	Modesto		576-2852			B
		Riverbank				
408	Monterey		646-9092			C
		Carmel				
213	Norwalk		404-2237			C
415	Oakland		836-4911		834-3194	B
		Alameda				
		Berkeley				
		Orinda				
619	Oceanside		430-0613			C
415	Palo Alto		856-9995		856-0484	B
		Los Altos				
		Mountain View				
		Woodside				
714	Pomona		626-1284			C
916	Sacramento		488-6262		443-7434	B
408	Salinas		443-4940			B
415	San Carlos		591-0726		595-8870	B
		Redwood City				
		San Mateo				
619	San Diego		233-0233		231-1703	B
		Chula Vista				
		Coronado				
		La Jolla				
		La Mesa				
415	San Francisco		956-5777		788-0825	A
		Pacifica				
		Richmond				
		Sausalito				
408	San Jose		294-9119		286-6340	B
		Campbell				
		Saratoga				
		Sunnyvale				

Table 1. (Continued)

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	State Access Center		300/1200 bps	2400 bps	Class
213	San Pedro	Gardenia Lomita Long Beach	548-6141	514-1590	B
415	San Rafael	Mill Valley Novato	472-5360		C
415	San Ramon		829-6705		B
714	Santa Ana	Irvine Newport Beach Orange Westminster	558-7078	550-4625	B
805	Santa Barbara		682-5361		B
408	Santa Cruz	Felton	429-6937		C
707	Santa Rosa	Windsor	578-4447		C
209	Stockton		957-7610		C
707	Vallejo	Crockett Rodeo	552-6656		C
805	Ventura	Oxnard	656-6760		B
818	West Covina		915-5151		C
818	Woodland Hills	Malibu Reseda San Fernando Van Nuys	887-3160	348-7141	B
Colorado					
303	Colorado Springs		635-5361	578-0950	B
303	Denver	Aurora Englewood Littleton	337-6060	696-0159	A
303	Fort Collins		493-9131		B
303	Grand Junction		241-3004		C
303	Pueblo		542-4053		C
Connecticut					
203	Bridgeport	Fairfield Milford Trumbull	335-5055	367-9130	B
203	Danbury	Georgetown Redding Ridgefield	794-9075		B
203	Hartford	Farmington Manchester New Britain Simsbury West Hartford Windsor	247-9479	724-9396	B
203	New Haven	Bethany Branford	624-5954	773-3569	B
203	New London	Groton Mystic	447-8455		C
203	Norwalk	Westport Wilton	866-7404		B

Table 1. (Continued)

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	State Access Center		300/1200 bps	2400 bps	Class
203	Stamford	Darien Greenwich New Canaan Poundridge, NY	348-0787	359-9404	B
203	Waterbury	Naugatuck Southington Thomaston Wolcott Woodbury	753-4512		C
District of Columbia					
202	Washington	Alexandria, VA Annandale, VA Arlington, VA Bethesda, MD Camp Springs, MD College Park, MD Falls Church, VA Germantown, MD Laurel, MD McLean, VA Silver Spring, MD Springfield, VA Suitland, MD	429-7800 or 429-7896	429-0956	A
Delaware					
302	Newark	Hockessin New Castle Wilmington	454-7710	737-4340	B
Florida					
305	Boca Raton	Deerfield Beach Delray Beach	338-3701		C
813	Cape Coral	Ft. Myers	549-9000		C
904	Daytona Beach		255-2629		C
305	Ft. Lauderdale	Hollywood	764-4505	524-5304	B
904	Gainesville		338-0220		C
904	Jacksonville		353-1818	791-9201	B
813	Lakeland		688-4366		C
305	Melbourne		242-8247		C
305	Miami		372-0230	372-1355	A
813	Naples		263-3033		C
904	Ocala	Belleview	351-3790		C
305	Orlando	Winter Park	422-4088	422-8858	B
904	Pensacola		432-1335		C
305	Pompano Beach		941-5445		C
813	St. Petersburg		323-4026	327-1163	B
813	Sarasota		923-4563		C
904	Tallahassee		681-1902		B
813	Tampa		224-9920	223-5859	B
305	W. Palm Beach		833-6691		B
Georgia					
912	Albany		888-3011		C
404	Athens		548-5590		C
404	Atlanta		523-0834	584-0212	A
404	Augusta	Bath, SC	724-2752		C
404	Columbus		571-0556		C
912	Macon		743-8844		C
912	Savannah		236-2605		B

Table 1. (Continued)

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	State Access Center		300/1200 bps	2400 bps	Class
Hawaii[2]					
808	Oahu		528-0200		
800	All Other Islands		272-5299		
Idaho					
208	Boise		343-0611		B
		Meridan			
208	Lewiston		743-0099		C
Illinois					
312	Aurora		896-0620		C
		Batavia			
		Geneva			
		Naperville			
		Oswego			
309	Bloomington		827-7000		B
312	Chicago		938-0600	938-8725	A
		Berwyn			
		Oak Park			
217	Decatur		429-0235		C
		Elwin			
		Harristown			
815	Dekalb		758-2623		C
815	Joliet		726-0070		C
		Lockport			
		Minooka			
309	Peoria		637-8570		B
		Spring Bay			
		Sunnyland			
815	Rockford		965-0400		B
		New Milford			
217	Springfield		753-1373		B
217	Urbana		384-6428	328-0317	B
		Philo			
Indiana					
812	Bloomington		332-1344		C
812	Evansville		424-7693		B
		Newburgh			
		St. Joseph			
219	Ft. Wayne		426-2268	422-3431	B
		New Haven			
219	Gary		882-8800		B
		Hammond			
		Highland			
		Hobart			
		Portgage			
317	Indianapolis		299-0024	299-6766	B
		Cumberland			
317	Kokomo		455-2460		C
317	Lafayette		742-6000		C
		Romney			
		West Point			
317	Muncie		289-5068		C
		Gaston			
		Yorktown			
219	South Bend		233-7104		B
		Mishawka			
		Osceola			
812	Terre Haute		232-5329		C
		Riley			

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[2] *Service is provided by Telenet under FCC Tariff No. 2.*

Table 1. (Continued)

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	State Access Center		300/1200 bps		2400 bps	Class
Iowa						
515	Ames		233-6300			C
319	Cedar Rapids		364-0911		362-2764	B
		Ely				
		Fairfax				
319	Davenport		324-2445			C
		Moline, IL				
		Rock Island, IL				
515	Des Moines		288-4403		288-6206	B
		Norwalk				
319	Dubuque		556-0783			C
319	Iowa City		351-1421			C
		Liberty				
712	Sioux City		255-1545			C
319	Waterloo		232-5441			C
		Cedar Falls				
Kansas						
913	Topeka		233-9880			B
		Pauline				
		Tecumseh				
316	Wichita		262-5669			B
Kentucky						
502	Bowling Green		782-7941			B
502	Frankfort		875-4654			B
606	Lexington		233-0312			B
502	Louisville		589-5580		583-1006	B
		New Albany, IN				
Louisiana						
504	Baton Rouge		343-0753		343-0771	A
318	Lafayette		233-0002			C
318	Lake Charles		436-0518			C
318	Monroe		387-6330			B
504	New Orleans		524-4094		522-3967	A
318	Shreveport		221-5833			B
		Blanchard				
Maine						
207	Augusta		622-3123			B
		Sidney				
		Winthrop				
207	Brewer		989-3081			C
		Eddington				
		Hampden				
207	Lewiston		784-0105			C
		Auburn				
		Lisbon Falls				
207	Portland		761-4000			C
		Gorham				
		Scarborough				
Maryland						
301	Annapolis		224-8550			B
		Crofton				
		Severna Park				
		West River				
301	Baltimore		727-6060		752-5555	A
		Catonsville		Parkville		
		Dundalk		Towson		
		Essex				

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State Access Center			300/1200 bps	2400 bps	Class
Massachusetts					
617	**Boston**		**292-0662**	**574-9244**	**A**
	Arlington		Dorchester	Melrose	
	Belmont		Everett	Newton	
	Brookline		Hyde Park	Quincy	
	Cambridge		Malden	Somerville	
	Charleston		Medford	Watertown	
617	**Brockton**		**580-0721**		**C**
		Bridgewater			
		Randolph			
617	**Framingham**		**879-6798**		**C**
		Natick			
617	**Lawrence**		**975-2273**		**C**
		Andover			
		Salem			
617	**Lexington**		**863-1550**		**B**
		Burlington			
		Waltham			
		Woburn			
617	**Lowell**		**937-5214**		**C**
		Billerica			
		Pelham, NH			
617	**New Bedford**		**999-2915**		**C**
413	**Northampton**		**586-0510**		**C**
		Amherst			
		East Hampton			
413	**Springfield**		**781-3811**		**B**
		Chicopee			
		Holyoke			
		Longmeadow			
		Ludlow			
617	**Woods Hole**		**540-7500**		**C**
617	**Worcester**		**755-4740**		**B**
		Auburn			
		Boylston			
		Leicester			
		Shrewsbury			
Michigan					
313	**Ann Arbor**		**996-5995**	**665-2900**	**A**
		Dexter			
		Ypsilanti			
616	**Battle Creek**		**968-0929**		**B**
313	**Detroit**		**964-2988**	**963-2274**	**A**
313	**Flint**		**235-8517**		**B**
		Flushing			
616	**Grand Rapids**		**774-0966**		**B**
517	**Jackson**		**782-8111**		**C**
		Hanover			
		Parma			
616	**Kalamazoo**		**345-3088**		**B**
		Richland			
517	**Lansing**		**484-0062**		**B**
		Holt			
517	**Midland**		**832-7068**		**C**
		Auburn			
		Sanford			
616	**Muskegon**		**726-5723**		**C**
313	**Pontiac**		**332-5120**		**C**
		Auburn Heights			
		Rochester			
517	**Saginaw**		**790-5166**	**799-3190**	**B**
313	**Southfield**		**827-4710**		**C**
		Farmington			
		Livonia			
		Troy			

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	State Access Center		300/1200 bps		2400 bps	Class
616	**Traverse City**		**946-2121**			**C**
		Interlochen				
313	**Warren**		**575-9152**			**B**
		Roseville				
		Troy				
Minnesota						
218	**Duluth**		**722-1719**			**B**
612	**Minneapolis**		**341-2459**		**338-1661**	**A**
		St. Paul				
507	**Rochester**		**282-5917**			**C**
612	**St. Cloud**		**253-2064**			**C**
Mississippi						
601	**Jackson**		**969-0036**			**B**
		Clinton				
Missouri						
314	**Columbia**		**449-4404**			**B**
314	**Jefferson City**		**634-5178**			**C**
816	**Kansas City**		**221-9900**		**472-1430**	**A**
		Gladstone		Overland Park, KS		
		Independence		Raytown		
		Kansas City, KS				
816	**St. Joseph**		**279-4797**			**C**
314	**St. Louis**		**421-4990**		**421-0381**	**A**
		E. St. Louis, IL				
		Webster Groves				
417	**Springfield**		**864-4814**			**B**
Montana						
406	**Billings**		**245-7649**			**C**
406	**Helena**		**443-0000**			**B**
406	**Missoula**		**721-5900**			**C**
Nebraska						
402	**Lincoln**		**475-4964**		**475-3839**	**B**
		Denton				
402	**Omaha**		**341-7733**			**B**
		Council Bluffs, IA				
Nevada						
702	**Las Vegas**		**737-6861**			**B**
702	**Reno**		**827-6900**		**827-5290**	**B**
New Hampshire						
603	**Concord**		**224-1024**			**B**
		Chicester				
		Suncook				
603	**Manchester**		**627-8725**			**C**
		Bedford				
603	**Nashua**		**880-6241**			**C**
		Merrimack				
		Pelham				
603	**Portsmouth**		**431-2302**			**B**
		Kittery				
		Rye Beach				

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State Access Center			300/1200 bps	2400 bps	Class
New Jersey					
609	Atlantic City	Ocean City	348-0561		B
201	Hackensack	Englewood River Edge Teaneck	488-6567	488-2063	B
609	Marlton	Haddonfield Medford Moorestown	596-1500		B
609	Merchantville	Collingswood Camden	663-9297	665-6860	B
201	Morristown	Madison Rockaway Whippany	455-0275	644-4745	B
201	New Brunswick	Franklin Park Metuchen	745-2900	745-7010	B
201	Newark	Bayonne Bloomfield Elizabeth Jersey City Nutley Orange Verona	623-0469	623-7122	A
201	Passaic	Belleville Nutley Rutherford	778-5600	773-3674	B
201	Paterson	Fairlawn Ridgewood	684-7560	742-4415	B
609	Princeton	Hightstown Lawrenceville	799-5587		A
201	Roseland		227-5277	227-6722	B
201	Sayreville		525-9507		B
609	Trenton	Ewing Mercerville	989-8847		B
New Mexico					
505	Albuquerque		243-4479		B
505	Sante Fe		473-3403		C
New York					
518	Albany	Troy	465-8444	465-8632	B
607	Binghampton	Endicott	772-6642		B
716	Buffalo	Tonawanda West Seneca	847-1440	847-1825	B
516	Deer Park	Babylon Bayshore Brentwood Midland	667-5566		B
516	Hempstead	Floral Park Freeport Hicksville Plainview	292-3800	485-3380	B

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	State Access Center		300/1200 bps	2400 bps	Class
607	Ithaca		277-2142		C
		Etna			
		Newfield			
212	New York City		620-6000 741-4950 or 741-8100	645-0560	A
716	Niagara Falls		282-1462		C
		Lewiston			
		Sanborn			
518	Plattsburgh		562-1890		C
914	Poughkeepsie		473-2240	473-3200	B
		Hyde Park			
		Marlboro			
716	Rochester		454-1020	454-5730	B
315	Syracuse		472-5583	479-5445	B
		Fayetteville			
315	Utica		797-0920		B
		Rome			
914	White Plains		328-9199	682-3505	B
		Byram, CT			
		New Rochelle			
		Port Chester			
		Scarsdale			
North Carolina					
704	Asheville		252-9134		B
		Leicester			
704	Charlotte		332-3131	333-6204	A
919	Fayetteville		323-8165		C
919	Greensboro		273-2851	275-1251	B
919	High Point		889-7494		B
919	North Wilkesboro		838-9034		C
919	Research Tri Pk.		549-8139	541-9096	B
		Davidson			
		Durham			
		Raleigh			
919	Tarboro		823-0578		C
		Rocky Mount			
919	Wilmington		763-8313		C
919	Winston-Salem		725-2126		B
		Kernersville			
		Oldtown			
North Dakota					
701	Fargo		237-3442		C
		Moorhead, MN			
701	Mandan		663-2256		B
		Bismarck			
Ohio					
216	Canton		452-0903		B
513	Cincinnati		579-0390	241-8008	A
216	Cleveland		575-1658	771-6480	A
		Maple Heights			
614	Columbus		463-9340	461-9044	A
		Grove City			
513	Dayton		461-5254	461-0755	B
216	Elyria		323-5059		C
216	Kent		678-5115		A
		Akron			
		Hudson			
		Ravenna			

Table 1. (Continued)

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Telenet Communications Corporation

State Access Center			300/1200 bps	2400 bps	Class
216	Lorain		960-1771		C
419	Mansfield		526-0686		C
513	Springfield		324-1520		C
		Enon			
		North Hampton			
419	Toledo		255-7881	255-1906	B
		Maumee			
		Perrysburg			
		Sylvania			
216	Warren		394-0041		C
216	Youngstown		743-1296	743-6843	B
		Canfield			
		Hubbard			
Oklahoma					
918	Bartlesville		336-3675		C
		Dewey			
405	Oklahoma City		232-4546	232-9513	B
		Bethany			
		Britton			
405	Stillwater		624-1112		B
918	Tulsa		584-3247	587-2774	B
		Sand Springs			
Oregon					
503	Corvallis		754-9273		C
503	Eugene		683-1460		C
503	Hood River		386-4405		C
503	Medford		779-6343		B
		White City			
503	Portland		295-3028	241-0496	A
		Beaverton			
503	Salem		378-7712		B
Pennsylvania					
215	Allentown		435-3330	770-1405	B
		Bethlehem			
		Emmaus			
717	Carlisle		249-9311		C
717	Danville		271-0102		C
814	Erie		899-2241		B
		McKean			
717	Harrisburg		236-6882	236-2007	B
814	Johnstown		535-7576		B
		Seward			
		Southfork			
215	King of Prussia		337-4300	337-2850	B
		Bryn Mawr			
		Valley Forge			
		Wayne			
717	Lancaster		295-5405		C
		Millersville			
		Mountville			
215	Philadelphia		574-9462	574-0990	A
		Bala Cynwyd			
		Havertown			
		Lansdowne			
		Upper Darby			
412	Pittsburgh		288-9950 or 288-9974	471-6430	A
		Bethel Park			
		Carnegie			
		Glenshaw			

Table 1. (Continued)

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	State Access Center		300/1200 bps	2400 bps	Class
215	Reading		376-8750		C
717	Scranton		961-5321		B
		Dalton			
814	State College		231-1510		C
717	Wilkes Barre		829-3108		C
		Kingston			
		Plymouth			
717	Williamsport		494-1796		C
717	York		846-6550		B
		Manchester			
Rhode Island					
401	Providence		751-7912	831-3990	B
		Pawtucket			
		Seekonk			
		Warwick			
South Carolina					
803	Charleston		722-4303		B
803	Columbia		254-0695		B
803	Greenville		233-3486	271-0231	B
803	Spartanburg		585-1637		C
South Dakota					
605	Pierre		224-0481		B
605	Rapid City		348-2621		C
605	Sioux Falls		336-8593		C
		Brandon			
Tennessee					
615	Bristol		968-1130		C
		Bluff City			
615	Chattanooga		756-1161	265-7929	B
615	Johnson City		282-6645		C
		Jonesboro			
615	Knoxville		523-5500	521-5072	B
		Powell			
901	Memphis		521-0215	527-5175	B
615	Nashville		244-3702	255-2608	B
615	Oak Ridge		481-3590		C
		Clinton			
		Oliver Springs			
Texas					
915	Abilene		676-9151		B
806	Amarillo		373-0458	373-1833	C
214	Athens		677-1712		C
512	Austin		928-1130	929-3622	B
512	Brownsville		542-0367		C
409	Bryan		822-0159		C
512	Corpus Christi		884-9030		B
214	Dallas		748-6371	745-1359	A
		Irving			
		Mesquite			
915	El Paso		532-7907		B
817	Ft. Worth		332-4307	332-6794	A
409	Galveston		762-4382		B
713	Houston		227-1018	227-8208	A
512	Laredo		724-1791		C

Table 1. (Continued)

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Telenet Communications Corporation

	State Access Center		300/1200 bps	2400 bps	Class
214	Longview		236-4205		C
806	Lubbock		747-4121		C
512	McAllen		686-5360		C
915	Midland		561-9811	561-8597	B
		Odessa			
		Terminal			
409	Nederland		722-3720		B
		Bridge City			
		Port Arthur			
915	San Angelo		944-7621		B
512	San Antonio		225-8004	225-3444	B
		Foster			
817	Temple		773-9423		C
214	Tyler		597-8925		C
817	Walco		752-9743		C
Utah					
801	Ogden		627-1630		C
801	Provo		373-0542		C
		Orem			
801	Salt Lake City		359-0149	359-0578	B
		Kearns			
		Murray			
Vermont					
802	Burlington		864-0808		B
		Essex Junction			
802	Montpelier		229-4966		B
		Barre			
802	Rutland		775-1676		C
		Proctor			
802	White River		295-7631		C
Virginia					
804	Charlottesville		977-5330		C
703	Covington		962-2217		C
703	Harrisonburg		434-7121		C
703	Herndon		435-1800		B
		Centreville			
		Fairfax			
		Reston			
		Vienna			
804	Lynchburg		845-0010		C
804	Newport News		596-6600		B
804	Norfolk		625-1186	625-2408	B
		Portsmouth			
		Virginia Beach			
804	Richmond		788-9902	353-0219	B
703	Roanoke		344-2036		C
		Salem			
Washington					
206	Auburn		939-9982		B
206	Bellingham		733-2720		C
206	Everett		TBA		C
206	Longview		577-5835		B
206	Olympia		754-0460		C
509	Richland		375-5377		B
206	Seattle		625-9612	623-9951	A
		Bellevue			
		Kirkland			

Table 1. (Continued)

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REPRODUCTION PROHIBITED—FOR REPRINTS, CALL 1-800-328-2776

	State Access Center		300/1200 bps	2400 bps	Class
509	Spokane		455-4071	838-9065	B
206	Tacoma		627-1791		B
509	Wenatchee		663-6227		B
West Virginia					
304	Charleston		345-6471		B
		Elkview			
304	Huntington		523-2802		C
304	Morgantown		292-0104		C
Wisconsin					
715	Eau Claire		836-9295		C
		Elk Lake			
414	Green Bay		432-2815	432-0346	C
		Oneida			
414	Kenosha		552-9242		C
608	Madison		257-5010		B
		Middleton			
414	Milwaukee		271-3914	278-8007	A
414	Neenah		722-7636		C
		Appleton			
		Larsen			
414	Racine		632-6166		C
414	Sheboygan		452-3995		C
Wyoming					
307	Casper		265-5167		C
307	Cheyenne		638-4421		B
307	Laramie		721-5878		C

Table 1. (Continued)

access interface provides full switching capability and SDLC among terminal clusters and any number of IBM-compatible host computers.

The Public Network is made up of a group of high-speed circuits capable of handling data speeds up to 56 kilobits per second (K bps). As part of US Sprint, which is currently building a 23,000-mile fiber-optic network, Telenet's backbone network will consist primarily of fiber-optic, high-speed lines. Each node forms the hub of an efficient local distribution network, linking other access and switching centers in outlying cities at speeds up to 19.2K bps. The TP4000 switches set up calls, route traffic, and provide accounting and statistical reporting. Data is automatically rerouted around failed switches. Routing control of user data is distributed among the network switches.

Network Access

Customers can access the Telenet Public Data Network from anywhere in the continental U.S. by simply dialing a local Telenet telephone number or a WATS number. Internationally, the Public Network interconnects with some 70 overseas points through Telenet's International Gateway service or through transit carriers.

Another means of access is through private dial-in or dial-out ports on the network that are dedicated exclusively to a particular customer. Users with a large amount of connect time may find this type of access more economical, since charges are computed on a fixed monthly rate for unlimited use. Private dial service also offers the advantages of restricted access and the use of special protocols or control languages.

A third type of access is through a leased channel called a Dedicated Access Facility (DAF). A DAF is a synchronous direct connection between computer systems and the Telenet network, which utilizes the X.25 protocol conversion standard. An Interim Dedicated Access Facility provides immediate dial-up service until the permanent DAF is installed, thus reducing installation lead time by as much as three months.

Dedicated and Hybrid Data Networks

Telenet's extensive networking expertise enables the company to design and facilitate dedicated and hybrid networks. Once the dedicated network is designed, Telenet systems engineers proceed with ordering the proper equipment, installing it, training the user's personnel, and maintaining the network. The hybrid network may be a combination of the public and dedicated networks. Or, the network may combine different technologies such as packet switching and satellite transmission. It features the cost savings and control inherent in a dedicated network, and the flexibility of the Telenet public network.

Telenet's dedicated network design includes the host-independent, packet switched network, which consists of a freestanding network made up of switching nodes, backbone lines, and a management facility. Some of the characteristics of this network are the ability to switch between hosts; the ability to switch between applications; the presence of sophisticated network control; the availability of diagnostics; accounting information and statistics; switching performed by specially designed network nodes; host-independent network protocol; the availability of alternate routing; and efficient use of bandwidth.

The network is based on a concept called the Telenet Network Architecture, which basically is responsible for separating and defining the functions that take place in a packet-switching network. There are three such functions:

The Access Facility—consists of a variety of concentration devices communicating via a network access protocol known as CCITT Recommendation X.25. The most important attribute of the X.25 protocol is its ability to reduce recurring circuit costs. The other element in the Telenet access facility is the network interface processor. In addition to providing X.25 support where the host processor software does not support X.25, these processors support TTY, 3270, 2780/3780, and SNA/SDLC protocols.

The Switching Facility—consists of the backbone lines and the switching nodes. The backbone lines can be terrestrial microwave, analog or Dataphone Digital Service (DDS), fiber-optic facilities, or satellite circuits. The switching node is a Telenet-manufactured processor. It is based on a multiple microprocessor architecture of third-generation (as opposed to second-generation) minicomputers, or a first-generation mainframe. The switching node offers modular maintenance; easy expansion; lower costs, because the user only pays for the processing power needed; and higher reliability, since Telenet's design allows for hardware redundancy.

The Management Facility—consists of a network control processor running network control application programs. From the Network Control Center (NCC), certain functions are performed, including remote diagnostics, alarm, and event reporting. In addition, the NCC creates the routing tables used throughout the network, and maintains and provides all network software loads. The Telenet network includes three management facilities options: the Telenet network control center, a customer network control center, and a customer network control console.

Optional Local Error Protection

The Microcom Networking Protocol (MNP) augments the error-checking capabilities of the Telenet network by providing a local loop error detection/correction facility. Telenet supports data communication between personal computers and hosts, or between other systems that utilize the Microcom Networking Protocol (MNP). MNP provides for error-free data communication over a local dial-up telephone circuit linking a personal computer with the Telenet network. The data integrity on the local loop is maintained via an MNP reliable link algorithm.

PRICING

Telenet offers a variety of pricing arrangements based on network usage to maximize savings in monthly communication costs.

PUBLIC DIAL-IN SERVICE

Asynchronous Dial Service

300-1200 bps

Dial Location	Initial 2 Min.	Each Additional Min.
Class A Access Center	$.186	$.070
Class B Access Center	.326	.126
Class C Access Center	.526	.202
In-WATS	.966	.364

2400 bps

Dial Location	Initial 2 Min.	Each Additional Min.
Class A Access Center	$ .195	$.074
Class B Access Center	.342	.132
Class C Access Center	.552	.212
In-WATS	1.014	.382

PRIVATE DIAL-IN

Asynchronous Dial Service

300-1200 bps

Dial Location	Installation Charge	Monthly Charges/Port/Site		
		1-5	6-15	Over 15
Class A Access Center	$600	$290	$280	$270
Class B Access Center	600	460	445	435

2400 bps

Dial Location	Installation Charge	Monthly Charges/Port/Site		
		1-5	6-15	Over 15
Class A Access Center	$600	$355	$345	$335
Class B Access Center	600	495	480	470

PRIVATE OUTDIAL SERVICE

Asynchronous

To Telephone Networks From:	Speed of Service (bps)	Installation Charge	Monthly Charge/Port
Class A Access Center	300-2400	$600	$250
Class B Access Center	300-2400	600	325

Table 2. Telenet's Asynchronous Dial Services as of July 1986.

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Public dial-in service provides access to the telephone network by way of the local exchange and message toll telephone network. The charges given in Table 2 (Page OL20-900-117) are based on the length of the call.

The customer must pay all applicable telephone message unit and toll charges; Telenet does not accept collect calls. The rates are chargeable for each network call and the user is billed for each minute or fraction thereof rounded to the next higher minute; the resulting charge is rounded to the next higher cent. Each network is billed at a minimum rate equivalent to two minutes. In-WATS service provides access to the Telenet network from anywhere in the U.S. (except Alaska) via the telephone network.

The private dial-in service includes the associated modem at the Telenet Access Center as well as the local exchange line from the telephone network.

The private dial-out service includes the associated modem at the Telenet Access Center and the automatic calling unit. The customer is responsible for the installation and the monthly charges associated with the local exchange line, FX, or WATS service.

Table 3 provides details on special pricing plans offered by Telenet.

MICROCOMPUTER SOFTWARE/ SERVICES

PC Pursuit

PC Pursuit offers personal computer owners a reduced rate for utilizing Telenet for PC-to-PC communications. Through this service, personal computer users can send and receive realtime communications, access public databases, share programs, download computer software, and exchange messages on bulletin boards. PC Pursuit is now available in 14 major metropolitan areas: Atlanta, Boston, Chicago, Dallas, Denver, Detroit, Houston, Los Angeles, Newark, New York City, Philadelphia, San Francisco, Seattle, and Washington, DC. In 1986, an expanded PC Pursuit service was introduced for businesses, offering daytime access at discounted hourly rates.

X.25 Dial Service

Customers can acquire a dial-up X.25 communications link between their personal computers or X.25 terminals and the network. The customers' personal computers or terminals are fitted with a commercially available interface board or specially built modem, which can dial a Telenet access number and transmit data at up to 4800 bps. Personal computers can communicate through the X.25 dial service with multiple hosts on a full-duplex basis, which will allow them to make better use of their built-in processing capabilities.

3270 BSC/SDLC DAF Service

The 3270 BSC/SDLC DAF (Dedicated Access Facility) Service allows customers to utilize an end-to-end synchronous communications link between their personal computers and 3270 full-screen applications on IBM hosts. A personal computer can connect to multiple IBM hosts through Systems Network Architecture (SNA) or non-SNA environments. The 3270 BSC/SDLC DAF Service consists of a leased point-to-point line between the Telenet Central Office (TCO) and the customer's site; modems; and a 3270 BSC or SDLC access port in the TCO. The 3270 BSC/SDLC Dial Service uses a dial-up business line in place of the point-to-point line.

Extended Term Arrangements

Element	Term Discount (%) 1 Year	2 Years	3 Years
Telenet Processor	3	8	13
Dedicated Access Facility[1]	3	8	13
Public Dial-In Access[2]			
Class A, B, and C Access Centers	3	8	13
Private Dial-In Ports	3	8	13

Customers who subscribe to 1, 2, or 3-year Extended Term Arrangements will receive monthly discounts on charges for Telenet Processors (TPs), Dedicated Access Facilities (DAFs), and Public Dial-In Access in Class A, B, and C Access Centers and Private Dial-In Ports. Telenet's Volume Discount Plan or Time-of-Day Pricing discounts on network usage can also be applied. Traffic charges are not eligible for Extended Term Arrangements.

Volume Discount Plan

Dial Hours/ Month	Discount (%)	Kilosegments/ Month	Discount (%)
0-2000	0	0-2000	0
next 2000	10	next 2000	10
next 1000	20	next 1000	20
each additional	30	each additional	30

Discounts are applied separately to public dial usage in Class A, B, or C Access Centers, and they cannot be combined for purpose of this discount. Public dial hours and traffic charges already discounted under Time-of-Day Pricing cannot be included in calculating Volume Discounts, but Extended Term Arrangement discounts, if applicable, still apply. Discounts are subject to change on 60-day notice.

Time-of-Day Pricing

All network usage from Class A, B, and C Access Centers for network calls originating and terminating during the hours of 9:00 PM to 6:00 AM local time on weekdays, all day Saturday, Sunday, and on five major holidays[3] is charged at 50% of normal rates. Public Dial-In and Traffic charges discounted in this way are ineligible for the Volume Discount Plan but may be combined with Extended Term Arrangement discounts, if applicable.

NOTES:

[1] This discount applies to the rate for a DAF 100 miles or less from the terminating Telenet Access Center. Additional mileage charges are not discountable.

[2] This discount applies only to usage associated with specific DAFs leased under Extended Term Arrangements.

[3] New Year's Day, July 4th, Labor Day, Thanksgiving, and Christmas Day.

Table 3. Public network special pricing as of July 1986.

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Telenet Communications Corporation

▷ Micro-Fone II Data Terminal/Telephone

Micro-Fone II Data Terminal/Telephone is an inquiry/response terminal utilizing payment systems, data capture, order entry, social services benefit distribution, and other transaction-based applications. The Micro-Fone II includes printer and PIN (personal identification number) pad ports, programmable prompt sets, and memory expansion capability, as well as remote programming, automatic data-to-voice switching, and data capture capabilities. Computer-based applications for the Micro-Fone II are:

Financial/Retail

Payment systems
Credit/debit card authorization
Check guarantee
Electronic funds transfer
Teller terminal functions

Social Services

Electronic benefits distribution
Data Capture
Payments/Collection
Order entry
Payroll reporting
Electronic messaging

TeleCARD

TeleCARD, a complete credit transaction processing service, offers credit authorization, data capture, and transaction processing services to banks and retailers. Users can employ the Micro-Fone II to authorize credit transactions and to keep electronic records of user credit card sales via the Telenet network.

Telemail

Telemail is Telenet's electronic communication service that allows the user to gather sales data, enter and verify orders, manage inventories, file reports, and distribute financial information throughout the company. Available 24 hours a day, 7 days a week, Telemail is accessible through the Telenet Public Data Network from a data terminal and a telephone over dial-up lines from almost any location. Telemail also accommodates a wide variety of communications devices, including TWX and Telex terminals.

Telemail offers an array of applications accommodating the user's needs.

Applications available for sales and marketing include:

- Remote order entry
- Product announcements
- Forecasting and market research
- Pricing information
- Travel provisions
- Sales management

Applications for finance include:

- Payments and collections
- Market volume and share statistics
- Gathering financial information from dispersed locations
- Money management
- Report standardization

Operations applications include:

- Inventory management
- Dispatching service calls
- Dissemination of products
- Order processing

Administration applications include:

- Project reporting
- Authorization and delegation of duties
- Proposal development
- Issuing corporate guidelines and policies

Telemail can also be adapted to the individual business needs of its customers by using its delivery classifications system, bulletin board feature, and Inform Script. With its Inform Script feature, a user can create customized standard forms for call reports, price lists, memos, promotional announcements, and other business needs. Telemail also provides conventional delivery classifications for special handling, including urgent, registered, return receipt, and private. Another Telemail feature is its two levels of security. Users can only access Telemail with a unique username and password. A second confidential password is required to read messages classified as private. In addition, the bulletin board feature provides a method of broadcasting information to an unlimited number of people.

FUTURE PLANS

In the future, Telenet plans to reach beyond provision of "packet switched" services to become a central source for complete, end-to-end data communications services. Telenet plans to expand and enhance existing private network offerings while continuing to provide high-quality public data network services. In addition, Telenet will continue to seek new applications for its products and services, developing new technologies to suit customers' specific needs. For complete, up-to-date information on Telenet products and services, call (800) TELENET. □

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Telerate, Inc.

COMPANY INFORMATION

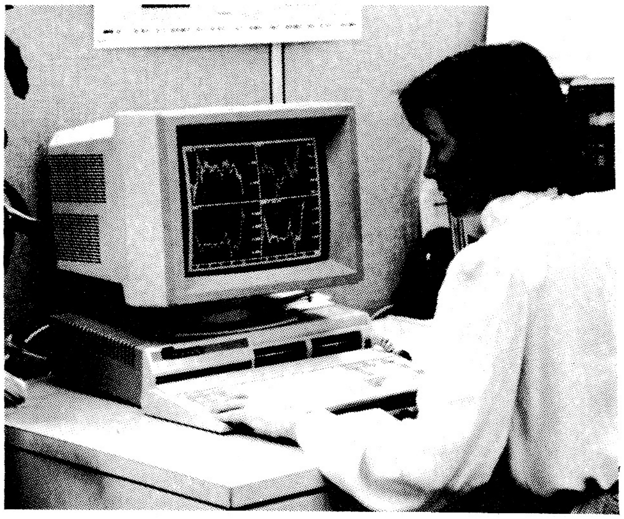
Telerate, Inc.
One World Trade Center
New York, NY 10048
Telephone (212) 938-5200

Company Background

Telerate, Inc. was founded in 1969 to provide realtime coverage of U.S. money markets. A pioneer in the electronic delivery of financial information, Telerate initially offered realtime prices for commercial paper. The company's present coverage includes prices, rates, and other data on government securities; equities; money market instruments; foreign exchange; Eurobonds; corporate bonds; mortgage-backed securities; precious metals; futures and options; and energy markets. More than 2,000 major financial institutions contribute their quotations to Telerate's database, which has grown to more than 60,000 video pages of information.

Subscribers receive this information through dedicated terminals or via personal computers, satellite, or FM radio sideband. Currently, Telerate information is accessed on more than 75,000 video display screens worldwide.

In the U.S., Telerate's users include the 100 largest banks and 50 largest investment banking and brokerage firms. Smaller firms and private investors also subscribe to Telerate's services, as do traders and investors in more than 70 other countries.



Telerate, Inc. offers realtime market quotations via Telerate Systems Incorporated. The company sells several software products that enable users to manipulate and analyze its data in realtime. Shown here is TeleTrac, a package that allows traders to perform graphic, technical analyses on Telerate's realtime cash and futures information.

Telerate, Inc., through Telerate System Incorporated, provides realtime market quotations and other statistics to financial institutions and corporations. A network of more than 2,000 banks, brokerage houses, and dealers, along with Telerate's own market reporters, provides subscribers with market data on U.S. Treasury and federal agency securities, money market instruments, stocks and commodities, foreign exchange, money market securities, precious metals, and financial futures as well as financial news services. This information is currently distributed to more than 75,000 display screens in over 70 countries worldwide.

Telerate also carries information from several major newswires, including Dow Jones. Users access Telerate data through the company's dedicated terminals, handheld monitors, and through personal computers that can receive information via satellite or FM sideband technology.

REPORT HIGHLIGHTS: PAGE

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Dow Jones & Company, Inc. owns a 67 percent share in Telerate, and the two companies have worked together closely in a number of ventures. Also, Telerate and Lotus Development Corporation have a joint development and marketing pact. Under the terms of the agreement, Telerate will furnish a realtime datafeed, which would be integrated into a Lotus 1-2-3 (Version 3) spreadsheet, while Lotus would design 1-2-3-based analytical software for the service. Finally, Telerate and AT&T formed a partnership to develop and market electronic transaction systems for worldwide financial markets.

Telerate, Inc., the parent company, has one operating company—Telerate Systems, Inc. For 1988, Telerate reported revenues of $440.4 million, a 31 percent increase over 1987's revenues. The company went public in 1983, and its stock is traded on the New York and Pacific stock exchanges under the symbol TLR.

Competitive Position

Telerate views Reuters as its only true competitor on a total product line basis. Reuters is considered the worldwide leader in furnishing realtime data to the financial community.

▷

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Currently, Telerate's data services in the areas of U.S. government securities and domestic money market instruments control more of the market than similar Reuters' services. As Telerate moves into foreign exchange dealing, however, it will find itself playing catch-up with Reuters. Reuters Dealing 2000 system, set to reach its potential in 1990, will be hard to match. Reuters' ownership of Canadian on-line vendor I.P. Sharp Associates, the world's leading provider of numeric databases also gives it an ongoing competitive advantage. Reuters plans to integrate realtime and historic databases to create a unique information service.

Reuters also competes with Knight-Ridder, Quotron, and Blumberg. With these companies, however, Telerate only competes in small market segments.

Telerate continues to grow admirably (revenues rose by 31 percent for 1988), although President Neil Hirsch says the company is still feeling the effects of the "postcrash shakeout" in its marketplace. Fortunately, the company is attracting enough new subscribers to keep revenue growth high.

For Telerate, new subscribers have also brought new challenges, which the company is meeting head-on. For example, it is upgrading its communications network to handle the increased traffic. The company is also broadening its product line, although the associated capital expenses are impacting its earnings.

Telerate is moving into transaction products; it will make its first transaction product, The Trading Service, commercially available in the second quarter of 1989. Telerate and AT&T are developing this electronic transaction system for the foreign exchange market. Telerate expects it will produce revenue during the last quarter of the year.

RESOURCES AND FACILITIES

Processing Centers

Telerate maintains computer processing centers in New York City and London.

Sales and Marketing Services

The Telerate service is distributed in more than 40 countries through a network of nearly 70 sales offices. Also, in addition to its worldwide headquarters in New York City, Telerate maintains regional offices in Europe and Asia, as follows:

Europe/Gulf
Telerate (U.K.) Limited
Winchmore House
12-15 Fetter Lane
London EC4A-1BR England
44-1-583-0044

Asia/Pacific
Telerate (Asia/Pacific) Limited
Three Exchange Square
8 Connaught Place
Hong Kong
852-5-868-2687

Pricing

Subscription charges vary with the mix of services chosen, usage, and the user's choice of hardware. The average Telerate subscriber pays the company about $750 per month per terminal.

NETWORKING SERVICES

Telerate operates its own high-speed data communications network. This network links contributors and subscribers on six continents. It features 300,000 miles of dedicated telephone lines and four satellites. Subscribers may also access Telerate's services through the Tymnet telecommunications network.

MICROCOMPUTER SOFTWARE/SERVICES

Tactician

Tactician is a PC-based decision support analysis system combining realtime price and yield information, sophisticated analytics, and a five-year historical database. It is designed to facilitate analysis of the fixed income and money market areas.

Several versions of Tactician are available:

U.S. Version

The U.S. version of Tactician offers three modules: cash, futures, and options.

Cash Module—offers realtime pricing from market makers including Cantor Fitzgerald; on all U.S. Treasuries; money center CDs; Eurodollar deposits; LIBOR rates; BAs; commercial paper; term RP rates; DJIA; S&P index; the Telerate Interest Composite; and a two-year historical database.

Futures Module—contains realtime pricing from the Chicago Board of Trade and the Chicago Mercantile Exchange on bill, bond, and note futures; Eurodollar futures; and the S&P.

TABLE 1. AREAS COVERED BY TELERATE'S DATABASE CONSISTING OF MORE THAN 30,000 VIDEO PAGES OF INFORMATION

- Bankers Acceptances
- Bank Rates
- Bond Indicators
- Bonds
  - Corporate
  - Eurocurrency
  - Government
  - Municipal
- Certificates of Deposit
- Commentary
- Commercial Paper
- Commodities Futures
- Economic Indicators
- Eurodeposits
- Federal Funds
  - Open-Market Activities
- Foreign Exchange
  - Cross Rates
  - Forward Rates
  - Spot Rates
- Futures
  - Currencies
  - Financial Instruments
- Energy
  - Cash/Spot Rates
  - Futures
  - Statistics
- International
  - Statistics
- Interest Rates
- International Money Rates
- Money Markets
- Mortgage-Backed Securities
- Newswires
- Options
- Precious Metals
- Repurchase Agreements
- U.S. Federal Agency Securities
- U.S. Treasury Securities

Options Module—contains realtime pricing from the Chicago Board of Trade and the Chicago Mercantile Exchange on options on bill, note, and bond futures, and Eurodollar futures.

U.K. Version

Like the U.S. version of Tactician, the U.K. version offers three modules: cash, futures, and options.

Cash Module—offers realtime pricing from four U.K. Gilt market makers on all U.K. Gilts. A five-year historical database from the Bank of England is also available.

Futures Module—contains realtime pricing from LIFFE for the long Gilt and medium Gilt futures, and a five-year historical database.

Options Module—contains realtime pricing and historical prices from LIFFE for all traded options on the long Gilt contract.

Australian Version

This version of Tactician offers two modules: cash and futures and options.

Cash and Futures Module—offers realtime pricing from three leading brokers on all Australian government bonds and notes, index bonds, and bank bills via the cash module. The bond and bill futures are updated in realtime directly from the Sydney Futures Exchange. A two-year historical database covering all securities is also available.

Options Module—contains realtime pricing from the SFE for all bond and bill futures.

Realtime Spreadsheet

Telerate's realtime spreadsheet product integrates live equities and exchange data into a commercial spreadsheet. It also automatically recalculates whenever prices change.

TeleTrac

TeleTrac is a trading software package that enables financial professionals to do graphic, technical analyses on Telerate's realtime market data using preprogrammed studies or their own analytics. Its resident routines offer analytics ranging from moving averages and stochastics to spreads and a Market Profile. Telerate claims that Teletrac is an excellent training tool in that it is easy to learn and use.

Delivery Systems

Telerate Matrix

Telerate Matrix is an information system that offers cut and paste capabilities from selected Telerate pages. A windowing feature enables subscribers to build full-color composite screens. Its graphic and analytic capabilities are useful for subscribers who need to analyze market conditions and directions.

Telerate PDQ/TIPS

Telerate offers two portable, battery-powered, handheld terminals, *Telerate PDQ* (Pocket Display Quotes) and *Telerate TIPS* (Telerate Information Pager Service). These are designed for traders, brokers, and portfolio managers who need to closely monitor rapidly moving markets while "on the go."

Telerate, Inc.

Telerate Access Service

Telerate offers software that enables users to manipulate and analyze (as well as access) its data in realtime. Designed for investors who need to closely monitor world and domestic markets, the Telerate Access Service (TAS) delivers realtime prices, rates, news, and other data to subscribing personal computer users. The TAS package, which includes communications software and operating instructions, enables users to access any of Telerate's 60,000 pages of information at a fraction of the cost of a dedicated terminal. Through Telerate's QuickQuote service, subscribers can retrieve realtime exchange quotations.

Multiport Controller/Terminal

The Multiport Controller/Terminal is used for accessing international equity quotations, Telerate data, and other host computers via a single workstation. Subscribers can move from quotations to communications with as few as two keystrokes. Each Multiport controller can handle eight workstations.

Data Feed Options

Telerate Digital Page Feed (TDPF)—designed for multi-terminal trading rooms, TDPF delivers data through a single high-speed communications line directly to an in-house system for display on authorized systems. Connecting additional terminals to the system can be handled without the need for rewiring or installing new phone lines.

Marketfeed—a consolidated datastream, Marketfeed provides data from each of the major international exchanges. The feed includes updated quotes, trade reports, index levels, market statistics, and market indicators.

ON-LINE DATABASES

Telerate Financial Information Network

Telerate's realtime financial information system provides data in the following areas:

- Fixed income rates on a wide range of North American, Asian, and European markets, including such money market instruments as government and corporate securities, federal funds, LIBOR, and commercial paper.
- Realtime stock, options, futures, precious metals, and commodities quotations from North American and international exchanges.
- Foreign exchange, including spot and forward rates in more than 100 currencies and currency options, futures, and options on futures.
- Energy market spot prices for petroleum products and condensates, crude oil, and realtime energy futures and options prices.
- Mortgage markets, including live broker rates on mortgage-backed securities, prices on adjustable rate mortgages, and a variety of asset-backed securities.

The database is accessed at more than 75,000 terminal locations and is updated throughout the day. More than 2,000 financial contributors worldwide furnish a steady stream of pricing information and quotations. In addition, information may be displayed in the form of specially designed pages, or in an item format. In each case, a signal alerts the user to fast-breaking news and highlights price changes to reflect market activity.

Table 1 lists the areas on which the Network provides information.

Telerate II Historical Domestic and International Database

This database includes information on both domestic and international financial data. The international portion of the database contains more than 300 series of data on international money market rates, foreign exchange rates, Eurocurrency deposit rates, economic indicators, gold, silver, and London Metal Quotations. The domestic part of the database provides current and historic market data on money market rates; U.S. government securities, including federal agency issues; and money market fund rates.

Telerate Futures Service

This service provides direct quotes from exchange tickers; a variety of customized displays of the five most recent transactions from the major exchanges; and side-by-side presentation of currency and metals futures along with prices from related cash markets.

Telerate News Services

Telerate offers subscribers access to all pertinent market-affecting news. Via a split-screen option, users can view timely information in a special six-line window, without interrupting data reception on the main part of the screen. News is available from *Dow Jones Capital Markets Reports*, *Dow Jones International News Wire*, and *Bond Buyer Wire*. Other Dow Jones services that are available include:

- Dow Jones News Bulletins
- Dow Jones International Banking Wire
- Dow Jones Forex Wire
- Dow Jones International Energy Wire
- Dow Jones Gold Wire
- Dow Jones Commodities Wire
- Dow Jones International Investment Wire

▷ • Dow Jones Fixed-Page Items

OTHER SERVICES

Telerate Expert

Telerate's Expert service provides traders with state-of-the-art, CD-ROM-based, computer-assisted learning programs and on-line dealing practice systems. The courseware covers such areas as money and foreign exchange markets, the role of the dealer and market instruments, foreign exchange markets, and interest rates and currency swaps. It is designed for dealers or brokers, marketing or account officers, financial industry trainees, financial industry training directors, corporate treasurers, managers, and nontrader personnel.

Telerate Energy Service

Telerate offers comprehensive coverage of energy cash market composite displays, energy futures, and options prices, which include spot market prices for crude oil, petroleum products, liquified petroleum gases, as well as contributors' market analyses and forecasting.

FUTURE PLANS

Telerate plans to add information from major European and Asian exchanges on commodities futures, options, and other areas. Telerate is also moving into the area of transaction products. The Trading Service, its first product in this category, will become commercially available during the second quarter of 1989. □

TRW Information Services Division

TRW Information Services Division (ISD), part of TRW, Inc., is a leading provider of business and consumer credit data. Its services are organized along three product lines: *Business Data Services* (commercial credit data), *Credit Data Services* (consumer credit information), and the newest division, *Target Marketing Services*.

ISD's business credit reports provide up-to-date trade payment information on approximately 11 million business locations. The consumer reports provide credit information on 143 million consumers to its subscribers. Target Marketing uses TRW's database of consumer credit information to provide marketing information to direct marketers.

Subscribers can access the ISD credit databases, maintained at TRW's computer center in Anaheim, California, via the TRW DataLink network. The databases are accessible in an interactive, realtime mode, through teleprinters or CPU-to-CPU communications. Batch inquiries and responses are handled as well. The company's business profile reports are also available on-line through NewsNet.

REPORT HIGHLIGHTS: **PAGE**

Application-Specific Services 102
On-Line Databases 103

COMPANY INFORMATION

TRW Information Services Division
505 City Parkway West
Orange, California 92668
Telephone (714) 385-7000

Company Background

TRW Information Services Division is a unit of TRW, Inc., which was founded in 1901 as the Cleveland Cap Screw Company. It began by making cap screws, and for many years provided studs, bolts, and valves for car and plane engines. Today, TRW manufactures products ranging from air bags for automobiles, to communications satellites that send messages throughout the world, to information services.

In 1969, TRW acquired Credit Data Corporation; in 1974, the division's name was changed to TRW Information Services Division (ISD). The Information Services Division supplies credit information to subscribers through the Credit Data unit. ISD originally supplied only consumer credit information but expanded into the business credit data reporting area in 1976 with the Business Credit Services unit. This was a cooperative effort with the National Association of Credit Management (NACM). The division's Target Marketing Services unit was formed in 1986.

Credit Data serves 25,000 customers at 62,700 locations in the United States, with a database of over 143 million consumer credit records. Business Credit Services has more than 8,000 clients and provides trade payment information on more than 11 million business locations. This information is processed through the ISD data center in Anaheim, California and is communicated to subscribers via the TRW DataLink Network in an interactive, realtime mode, through teleprinters or CPU-to-CPU communications.

TRW Information Services Division signed an agreement with NewsNet, Inc. (see Report OL20-692-101), providing its business profile reports to NewsNet subscribers. Contact NewsNet for additional information.

Competitive Position

TRW Information Services Division concentrates its credit reporting services on consumer information. It is one of the five largest U.S. computerized credit reporting agencies, along with TransUnion (Chicago, Illinois); Credit Bureau Inc., a division of Equifax (Atlanta, Georgia); Chilton (Dallas, Texas); and Associated Credit Service (Houston, Texas). In April 1988, TRW announced its intention to acquire Chilton from Borg-Warner Corporation (Chicago, Illinois). Finalization of the agreement is pending customary Justice Department approval.

The *business* credit reporting service industry is dominated, however, by Dun and Bradstreet, which has approximately 75 percent of the market share. For its part, TRW has managed to capture 8,000 customers in this area, and its market share is growing. Also, TRW's position in the direct marketing industry continues to grow. In 1987, TRW acquired Executive Services Company, a Richardson, Texas-based provider of direct marketing lists and services. While TRW's Target Marketing Services unit serves the business-to-consumer direct marketer, TRW's new Business Information Services unit handles business-to-business direct marketers.

RESOURCES AND FACILITIES

Processing Centers

The hardware portion of the TRW system is housed in a large dedicated facility in Anaheim. The TRW system has ▷

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complete redundancy. All critical elements are duplicated so that failure of a single element cannot result in a shutdown. A second facility in Richardson, Texas provides computer and data processing support for the company's direct marketing activities.

AVAILABILITY: TRW Information Services boasts an on-line availability rate of better than 99 percent.

RESPONSE TIME: Information can be obtained from the TRW system in 3 to 10 seconds using any terminal, terminal-emulating microcomputer, or teleprinter. Information can also be obtained verbally by contacting the Information Services Division.

USERS: Credit Data serves customers at 62,700 credit-granting locations. Business Credit Services has 8,000 clients and trade payment information on more than 11 million business locations. Target Marketing Services works with financial services companies, direct marketing firms, retailers, insurance companies, and nonprofit organizations nationwide.

DATABASE MANAGEMENT SYSTEM: The ISD database management system performs the basic housekeeping chores and includes programs for accessing, updating, modifying, and outputting credit data records. It also includes formatting programs that translate data into the form suitable for transmitting over DataLink (the TRW network), entering it on a preprinted form, or moving it from one storage medium to another.

Atlanta, GA[1,2,3]
Baltimore, MD[1,3]
Boston, MA[2]
Bridgeport, CT[1,2]
Buffalo, NY[1,2]
Charleston, SC[1]
Charlotte, NC[1]
Chicago, IL[1,2,3]
Cincinnati, OH[1]
Cleveland, OH[1,2]
Columbia, SC[1]
Columbus, OH[1,2]
Dallas, TX[1,2]
Denver, CO[1,2]
Detroit, MI[1,2]
Grand Rapids, MI[1]
Houston, TX[1,2]
Indianapolis, IN[1]
Jacksonville, FL[1]
Las Vegas, NV[1]
Los Angeles, CA[1,2,3]
Louisville, KY[1]
Manhattan, NY[2,3]
Miami, FL[1,2]
Minneapolis, MN[1]
Norfolk, VA[1]
Parsipanny, NJ[1,2]
Philadelphia, PA[2]
Portland, OR[1]
Raleigh, NC[1]
Reno, NV[1]
Richardson, TX[3]
Rochester, NY[1]
Sacramento, CA[1]
Salt Lake City, UT[1,2]
San Antonio, TX[1]
San Diego, CA[1,2]
San Francisco, CA[1]
Seattle, WA[1]
St. Louis, MO[1,2]
Syracuse, NY[1]
Toledo, OH[1]
Tulsa, OK[1]
Wilmington, DE[1,3]

KEY:
[1]Credit Data Services
[2]Business Credit Services
[3]Target Marketing Services

Table 1. TRW Information Services office locations.

Customer Support Services

TRW Information Services maintains offices at the locations shown in Table 1.

APPLICATION-SPECIFIC SERVICES

Credit

TRW Information Services provides credit information to its subscribers verbally or to a variety of terminals linked via high-speed data communications lines to TRW's central data file in Anaheim. Three separate services are provided: Credit Data Services, Business Credit Services, and Target Marketing Services.

Credit Data Services collects and stores factual credit information on more than 143 million consumers and provides that information to subscribers, including banks, retailers, and finance companies. The TRW Updated Credit Profile contains credit account information provided by subscribers, including positive and negative information about retail credit card accounts, bank charge card accounts, lines of credit, secured loans, and finance company accounts. The profile also includes selected public record information limited to tax liens, judgments, and bankruptcies. TRW does not collect information on checking and savings accounts, race, religion, sex, salary, personal life style, or criminal records.

Open current credit accounts remain on the profile indefinitely. Closed or paid accounts are removed within seven years. Adverse credit information remains on file for a maximum of 7 years, with the exception of bankruptcies, which remain for a maximum of 10 years.

TRW's credit reporting system provides credit information to credit grantors; they, in turn, provide TRW with a record of their past and present credit account information. The information is typically provided via magnetic tape, copied directly from the subscribers' billing records. These tapes are entered into the TRW computer system. This regular receipt of credit information provides TRW with an automatic update of the credit account information in the files. Public record information is gathered directly from court records.

Business Credit Services has been on-line since July 1976. It maintains objective trade payment and financial information on more than 11 million business locations, representing all major industries; key business facts; and comprehensive business and financial data supplied by the Standard & Poor's Corporation. More than 8,000 firms nationwide provide TRW with their automated and manual accounts receivable information every 30 to 90 days.

Target Marketing Services was created in 1986 to provide marketing information for the financial services industry. The unit now provides a variety of services that assist these institutions and other direct marketers to develop

▷ targeted lists of creditworthy customers, prepare mailing strategies, analyze consumer response to direct mail solicitations, and analyze their company's existing market share. Target Marketing Services uses the TRW PerformanceDATA System to provide direct marketing consumer list services, prescreen services, statistical modeling products, and direct marketing software services. TRW's PerformanceDATA System is a single database containing extensive demographic and credit information, including specific household and individual-level information.

NETWORKING SERVICES

The Information Services Division maintains a data communications network called *DataLink* over which its subscribers' inquiries are transmitted. This user-friendly network can be accessed with a local telephone call through almost any terminal, TWX, or telex machine. The network system, designed by ISD, includes hardware and software manufactured by Tymshare, Inc., plus dedicated leased communications facilities that include landlines, microwave links, and communications satellite links.

Peak capacity of the network is about 60,000 credit reports per hour, for a total of 500,000 per day.

ON-LINE DATABASES

Subscribers can access the ISD credit databases from their terminal or computer to make inquiries and receive responses. They cannot modify data in any way while online, however.

Consumer Credit Database—contains over 143 million consumer credit records. Access to this database is limited by law and by company policy to firms whose business includes the granting of credit to consumers and verifying information for employment and insurance purposes. The database includes identification information, such as name and address, generation (junior, senior, etc.), place of employment, social security number, and year of birth. It also includes factual payment information, such as open and closed credit accounts and payment balance information, and selected public record information limited to tax liens, judgments, and bankruptcies. Negative information is automatically removed from the file in six years, nine months or less; bankruptcies are removed in nine years, nine months. Positive information on good, open accounts is retained indefinitely. TRW claims to be the first credit reporting company to provide on-line consumer credit reports with credit risk predictor scores.

Business Credit Database—contains up-to-date trade payment data, representing companies' actual payment habits; a Trade Line Industry Profile, indicating how a company pays each of its suppliers according to an industry average; a Composite Industry Profile; a six-month payment trend; a quarterly credit pattern, indicating seasonal payment performance; a current payment guide; a Government Financial Profile, displaying accounts receivable information from federal agencies; public record information, such as Uniform Commercial Code filings, bankruptcies, judgments, bulk transfers, and tax liens; a Key Facts section, providing objective sales and management information; bank information; and inquiries. It also contains business and financial data supplied by the Standard & Poor's Corporation, including three years of comparative balance sheets, income statements, and critical ratios on 6,000 public companies; summary business information on over 50,000 companies; and in-depth business background information on 3,500 publicly held companies.

OTHER PROFESSIONAL SERVICES

To keep its clients informed, ISD publishes a *Trade Payment Guide* and a *Business Payment Index*. The *Trade Payment Guide* is published quarterly and includes information on approximately 3 million business locations nationwide. The book is available in both national and regional editions and offers a unique days-beyond-terms score that summarizes a business' current trade payment performance. The *Business Payment Index*, which indicates how American business collects and pays its bills, is published quarterly. ☐

Tymnet, Inc.

Tymnet, Inc., a division of McDonnell Douglas Information System Group, offers a public packet-switching data network service. Its product, TYMNET, services more than 500 organizations throughout the United States. It became commercially available in 1972, and is one of the largest packet switching networks in existence. The network's 10,000 public access ports, plus its direct connections, enable users to make local connections in more than 500 U.S. metropolitan cities. In addition to the public packet network, Tymnet also installs private networks worldwide. Through agreements with the International Record Carriers (IRC), TYMNET is accessible via local phone calls in 64 countries.

COMPANY INFORMATION

Tymnet, Inc.
2710 Orchard Parkway
San Jose, CA 95134
Telephone (408) 946-4900

Company Background

Tymnet, Inc. a part of McDonnell Douglas' Information Systems Group, is a major supplier of public data communications networks. One of its products, the TYMNET data network, was originated in 1969 to deliver the parent company's remote computing services to a widely dispersed population of users. Tymnet provides the interconnection between remote terminals, personal computers, and host computers based on intelligent communications processors connected by a network of leased telephone lines, microwave links, and satellite channels. The TYMNET public data network was developed by Tymshare, Inc., a computer services company that was bought by the Information Systems Group of McDonnell Douglas Corporation in April 1984.

TYMNET became commercially available in 1972. Within two years, TYMNET's facilities were supporting the traffic of approximately 30 companies. In response to this growing need for shared communications facilities, TYMNET became an FCC-regulated specialized common carrier in 1977. Tymnet, Inc. also began selling private network systems in 1978.

TYMNET is one of the largest public packet networks. Its value-added services include protocol conversion, allowing a variety of terminals and computer systems to communicate. The network service provides public dial-up access methods to the TYMNET network, as well as error-controlled communications to and from the source computer/terminal. TYMNET also provides the capability to integrate diverse applications, such as data collection, database access, and time-sharing.

In 1982, the FCC approved Tymnet's request to provide local Data Termination Service (DTS) using microwave broadcasting in 48 U.S. cities. Tymnet is also replacing existing leased lines with a network of microwave radio links. In addition, Tymnet is installing 27 satellite earth stations nationwide, that will provide high-speed links to supplement the existing terrestrial network.

Competitive Position

TYMNET is one of the largest public, value-added packet networks. Its competitors include GTE Telenet, CompuServe Network Services, RCA Cylix Communications Network, AT&T Information Services Network, IBM Information Network, GEISCO's MarkNet, ADP Autonet, and Uninet. TYMNET moved to the forefront in coverage by recently expanding its network to include more than 500 U.S. cities and over 64 international locations. The GTE Telenet value-added network extends to over 300 U.S. cities and more than 50 off-shore locations. The Uninet network can be accessed from more than 325 U.S. cities and from approximately 40 international locations. CompuServe Network Services are accessible in approximately 200 U.S. and Canadian cities. The RCA Cylix network provides domestic and Canadian coverage.

In expanding its communications capacity, TYMNET is taking steps to reduce its future dependence on telephone facilities. TYMNET's request to provide local Data Termination Service (DTS) using microwave technology in 48 U.S. cities was approved by the FCC in 1982. In another project in San Francisco, existing leased lines are being replaced with a network of microwave radio links. TYMNET is installing 27 satellite earth stations nationwide that will provide high-speed links to supplement the existing terrestrial network.

In order to provide local access to the TYMNET network from international points, TYMNET has made agreements with five International Record Carriers (IRCs): ITT World Communications, RCA Global Communications, Western Union International (now known as MCI International in the U.S., while retaining its Western Union name abroad), FTC Communications (FTCC), and TRT Telecommunications Corporation.

The recent acquisition of Tymnet by the McDonnell Douglas Information Systems Group (ISG) marks a significant step for the future of the company. McDonnell Douglas ISG companies comprise more than 13,000 employees and posted revenues of $1 billion in 1984. When combined, the units of ISG offer a unique blend of computer systems, products, and services.

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Tymnet, Inc.

High-Density Access Locations

Anaheim, CA
Ann Arbor, MI
Arlington, VA
Atlanta, GA
Austin, TX
Baltimore, MD
Belmont, CA
Birmingham, AL
Bloomfield, CT
Boston, MA
Boulder, CO
Brookfield, WI
Cambridge, MA
Campbell, CA
Charlotte, NC
Chicago, IL
Cincinnati, OH
Cleveland, OH
Columbus, OH
Cupertino, CA
Dallas, TX
Darien, CT
Denver, CO
Detroit, MI
Fairfax, VA
Garden Grove, CA
Hartford, CT
Hayward, CA

Houston, TX
Indianapolis, IN
Irvine, CA
Kansas City, MO
Los Altos, CA
Lyndhurst, NJ
Menlo Park, CA
Miami, FL
Milwaukee, WI
Minneapolis, MN
Mountain View, CA
Nashville, TN
New Orleans, LA
New York, NY
Newark, NJ
Newport Beach, CA
Norcross, GA
Oakland, CA
Oklahoma City, OK
Palo Alto, CA
Pawtucket, RI
Philadelphia, PA
Phoenix, AZ
Piscataway, NJ
Pittsburgh, PA
Portland, OR

Princeton, NJ
Providence, RI
Redwood City, CA
Rochester, NY
Sacramento, CA
Salt Lake City, UT
San Antonio, TX
San Carlos, CA
San Diego, CA
San Francisco, CA
San Jose, CA
Santa Ana, CA
Santa Clara, CA
Seattle, WA
Shawnee Mission, KS
Stamford, CT
St. Louis, MO
St. Paul, MN
Sunnyvale, CA
Tulsa, OK
Union, NJ
White Plains, NY

Medium-Density Access Locations

Akron, OH
Albany, NY*
Albuquerque, NM*
Alhambra, CA*
Allentown, PA*
Arcadia, CA
Baton Rouge, LA
Bethlehem, PA
Beverly Hills, CA
Boise, ID
Boulder City, NV
Bridgeport, CT
Canoga Park, CA
Carson City, NV
Chattanooga, TN
Chevy Chase, MD
Clearwater, FL
Colorado Springs, CO*
Colton, CA
Columbia, SC*
Corpus Christi, TX
Covina, CA
Davenport, IL
Davenport, IA
Dayton, OH
Des Moines, IA
Diamond Bar, CA
Downers Grove, IL

Durham, NC
El Paso, TX
El Segundo, CA
Englewood Cliffs, NJ
Escondido, CA
Fairfield, CT
Fort Lauderdale, FL*
Fort Worth, TX*
Fremont, CA
Glen Ellyn, IL
Grand Rapids, MI*
Greensboro, NC
Greenville, SC*
Harrisburg, PA*
Hempstead, LI NY*
Hollywood, FL
Huntsville, AL
Jackson, MI
Jackson, MS
Jacksonville, FL
Kalamazoo, MI
King of Prussia, PA
Knoxville, TN
Lansing, MI*
Las Vegas, NV
Lexington, KY
Little Rock, AR*
Long Beach, CA

Longwood, FL
Louisville, KY
Madison, WI
Mantea, CA
Melville, NY
Memphis, TN
Midland, TX
Midlothian, VA
Mission Hills, CA
Mobile, AL
Nashua, NH
New Haven, CT
Newport News, VA
Norfolk, VA
Norristown, PA
North Haven, CT
Northridge, CA
Omaha, NE
Ontario, CA
Orlando, FL
Oxnard, CA
Pasadena, CA
Pamona, CA
Plymouth, MI
Portsmouth, VA
Reno, NV
Richland, WA
Richmond, VA
Riverside, VA
Rockford, IL
Rock Island, IL

Rockville, MD
Salem, NC
San Bernadino, CA
San Fernando, CA
San Pedro, CA
Santa Barbara, CA
Santa Cruz, CA
Sherman Oaks, CA

South Bend, IN
Southfield, MI
Spokane, WA
Springfield, IL
Springfield, MA
St. Petersburg, FL
Syracuse, NY
Tampa, FL
Toledo, OH
Tucson, AZ
Valley Forge, PA
Van Nuys, CA

Ventura, CA
Vista, CA
Wayne, NJ
West Palm Beach, FL
Westhaven, CT
Westport, CT
Wheaton, IL
Wichita, KS
Winston, NC
Wilmington, DE
York, PA

*Private ports are not available in these cities.

Low-Density Access Locations

Abilene, TX
Aburdeen, MD
Alexandria, LA
Altoona, PA
Altleboro, MA
Alvany, CA
Amarillo, TX
Anderson, IN
Anniston, AL
Antioch, CA
Appleton, WI
Ardmore, OK
Asheville, NC
Atlantic City, NJ
Athens, GA
Auburn, MA
Augusta, GA
Aurora, IL
Bakersfield, CA
Bangor, ME
Battle Creek, MI
Baytown, TX
Belleville, IL
Bellingham, WA
Beloit, WI
Benton Harbor, MI
Billings, MT
Binghampton, NY
Bismark, ND
Boca Raton, FL
Bowling Green, KY
Bozeman, MT
Brewer, ME
Brockton, MA
Brownsville, TX
Bryan, TX
Burbank, CA
Burlington, VT
Cadillac, MI
Canton, OH
Casper, WY
Cedar Rapids, IA
Champaign, IL
Charleston, SC
Charlottesville, VA
Cherry Hill, NJ
Chico, CA

College Station, TX
Columbia, MO
Columbus, GA
Concord, CA
Corning, NY
Corona, CA
Cortland, OH
Cumberland, MD
Danbury, CT
Danville, IL
Davis, CA
Daytona Beach, FL
Decatur, IL
Denton, TX
Dover, DE
Downingtown, PA
Dubuque, IA
Duluth, MN
Eatontown, NJ
Eau Claire, WI
Elmira, NY
Enid, OK
Enumclaw, WA
Erie, PA
Eugene, OR
Eureka, CA
Evansville, IN
Fall River, MA
Fargo, ND
Fayetteville, NC
Fitchburg, MA
Forest Park, IL
Fort Collins, CO
Fort Meyers, FL
Fort Pierce, FL
Fort Smith, AK
Fort Wayne, IN
Freeland, MI
Freeport, IL
Fresno, CA
Gainesville, FL
Gary, IN
Grand Forks, ND
Great Falls, MT
Greeley, CO
Green Bay, WI
Greensburg, PA

Greenville, NC
Hagerstown, MD
Hamilton, OH
Hammond, IN
Highland, IN
High Point, NC
Hot Springs, AR
Huntington, WV
Idaho Falls, ID
Iowa City, IA
Ithaca, NY
Jackson, TN
Jefferson City, MO
Jefferson City, MI
Jersey City, NJ
Joliet, IL
Jonesboro, AR
Joplin, MO
Killeen, TX
Kingston, PA
Kokomo, IN
La Crosse, WI
Lafayette, IN
Lafayette, LA
Lake Zurich, IL
Lakeland, FL
Lancaster, PA
Las Cruces, NM
Latrobe, PA
Lawrence, KS
Lawrence, MA
Lawton, OK
Leavenworth, KS
Levittown, PA
Lewiston, ME
Lima, OH
Lincoln, NB
Longview, TX
Lowell, MA
Lynchburg, VA
Macon, GA
Manchester, NJ
Manhattan, KS
Manistee, MI
Mankato, MN
Mansfield, OH
Mar Vista, CA
Marina Del Rey, CA

Table 1. U.S. cities that provide public and private access to TYMNET, designated in three categories: High Density, Medium Density, and Low Density

Marietta, GA
Marion, IN
Marshalltown, IA
Marysville, OH
McAllen, TX
Medford, OR
Melbourne, FL
Meriden, CT
Merott Island, FL
Merrillville, IN
Midland, MI
Mineola, NY
Minot, ND
Missoula, MT
Modesto, CA
Monroe, LA
Montgomery, AL
Montpelier, VT
Moorestown, NJ
Morgantown, WV
Morristown, NJ
Muncie, IN
Muskegon, MI
Myersville, MD
Napa, CA
Nederland, TX
Neenah, WI
New Bedford, MA
New Castle, PA
New London, CT
Newport, RI
Niagara Falls, NY
Norwalk, CA
Norwich, CT
Oak Ridge, TN
Ocala, FL
Odessa, TX
Ogden, UT
Olympia, WA
Orem, UT
Oshkosh, WI
Owenboro, KY
Palm Springs, CA
Panama City, FL
Parkesburg, WV
Pascagoula, MS
Pennsaukin, NJ
Pensacola, FL
Peoria, IL
Petersburg, VA
Pittsfield, MA
Pleasant Hills, CA
Pleasanton, CA
Pocatello, ID
Port Arthur, TX
Port Huron, MI
Portland, ME
Poughkeepsie, NY
Provo, UT
Pueblo, CO
Racine, WI
Raleigh, NC
Rancho Bernardo, CA
Rapid City, SD
Reading, PA
Redding, CA
Ridgewood, NJ
River Forest, IL
Roanoke, VA
Rochester, MN
Rolla, MO
Rome, GA
Saginaw, MI
Salem, OR
Salina, KS
Salinas, CA
San Bruno, CA
San Clemente, CA
San Luis Obispo, CA
San Rafael, CA
Santa Fe, NM
Santa Monica, CA
Sarasota, FL
Savannah, GA
Scranton, PA
Shreveport, LA
Sioux City, IA
South San Francisco, CA
Spartanburg, SC
Springdale, AR
Springfield, MO
Springfield, OH
State College, PA
St. Charles, IL
St. Cloud, MN
St. Joseph, MI
St. Joseph, MO
Stockton, CA
Tacoma, WA
Tallahassee, FL
Taunton, MA
Terre Haute, IN
Thousand Oaks, CA
Topeka, KS
Traverse City, MI
Trenton, NJ
Tuscaloosa, AL
Tyler, TX
Urbana, IL
Utica, NY
Vallejo, CA
Vancouver, WA
Vicksburg, MS
Visalia, CA
Waco, TX
Walnut Creek, CA
Warren, OH
Waterbury, CT
Waterloo, IA
West Bend, WI
West Covina, CA
Wichita Falls, TX
Wilkes Barre, PA
Williamsburg, VA
Wilmington, NC
Winterhaven, FL
Woburn, MA
Woodland, CA
Woonsocket, RI
Worcester, MA
Yakima, WA
Youngstown, OH

Table 1. (Continued)

Service Locations

Tymnet provides data communications services for approximately 500 organizations with more than 1,500 host computers located throughout the United States. Currently, there are more than 1,800 nodes in the TYMNET network. Its dedicated access facilities, plus 10,000 public access ports, enable users to make local connections in more than 500 U.S. metropolitan areas. In addition, Tymnet provides a nationwide In-WATS service for areas without local access. Private dial-up and leased line ports are also available.

Tymnet subscribers in Canada can access host computers in the U.S. by originating the call with Datapac, the public packet switching network operated by the TransCanada Telephone System.

Table 1 (OL20-927-202) lists the U.S. cities that provide public and private access to TYMNET. For billing purposes, Tymnet has designated its U.S. access locations in three categories: High Density, Medium Density, and Low Density.

Users and Applications

TYMNET accommodates a wide variety of businesses, including computer service firms, manufacturers, oil companies, banks, security firms, consulting firms, publishers, libraries, research companies, government agencies, hospitals, universities, among others. More than a third of the Fortune 100 industrial companies are TYMNET users. Many large corporations with sophisticated needs create their own private data communications networks utilizing TYMNET technology.

Applications handled through TYMNET are as varied as the types of customers that use them, including the following:

- Order entry
- Inventory control
- Credit verification
- On-line database access
- Computer services
- Manufacturing distribution systems
- Accounting and statistical analysis
- Database management
- Computer-aided instruction
- Message switching
- Text editing
- Court scheduling
- Flight and reservations planning
- Library management
- Home and business information services

Network Control Center

The TYMNET Network Control Center, located in San Jose, CA, controls and monitors the entire network, 24 hours a day, seven days a week. By utilizing the network's "Supervisor" facility, operators monitor and control all lines, ports, and nodes in the network, as well as coordinate and dispatch maintenance when required.

Tymnet assumes all network management responsibilities. An experienced staff of communications professionals performs the following management functions: interfacing with multiple vendors and International Record Carriers (IRC), hardware and software maintenance, network monitoring, customer support, and network reconfigurations.

▷Customer Support

Tymnet offers its customers a variety of support services, including the following:

Communications Consultants—work with the customer's technical personnel to install dedicated interfaces, configure them according to individual requirements, and provide training on their use and capabilities. Communications Consultants also handle future changes in selected host interface options, and are available to assist with any difficulties.

Account Representatives—responsible for the day-to-day handling of customer accounts. They accept routine orders, handle billing questions, track order status, and work with customers to optimize the use of various TYMNET billing options. The Account Representatives also work with customers to forecast traffic volumes and future communications requirements.

Sales Representatives—assist in the design and implementation of data communications systems. In addition, the sales organization has a clearly defined set of escalation procedures to handle any requests or problems that cannot be satisfactorily resolved at the field level.

Customer Service—the initial interface for all network-related problems. Tymnet has a centralized Customer Service organization on-call 24 hours a day. The organization can generally handle network access problems directly, or they can direct inquiries to the appropriate group within Tymnet.

Maintenance—responsible for the initial installation and future upgrades or modifications of dedicated interface equipment. The Maintenance Organization routinely services TYMNET equipment, and is on-call 24 hours a day for unscheduled maintenance requirements.

NETWORKING

Network Components

TYMNET is a virtual circuit switching network composed of a matrix of intelligent nodes deployed across the country. Intelligent nodes are specially designed communications processors that perform three major functions: interface terminals to TYMNET, interface the customer's host computer to TYMNET, and accomplish switching. Special nodes, called gateways, provide interconnections to other public and private networks, as well as to international carriers.

TYMNET consists of more than 1,800 nodes, each a fully intelligent communications processor. Nodes are interconnected by leased lines, microwave links, and satellite channels, running from 4800 to 56K baud. This network design guarantees that all value-added features are available at every host interface and terminal access point in the network.

Tymnet designs and manufactures a modular communications processor called Engines. Their operating system, *ISIS (Internally Switched Interface System),* maps the characteristics, codes, and protocols assembled in each node. ISIS switches software services among the various users as required, allowing interconnection of similar and dissimilar devices by the same node.

The *Network Supervisor* is a software program that runs on a network node and maintains global knowledge of the conditions of the network. One Supervisor is in active control of the network at all times. In addition, at least four other nodes are on standby in separate geographic locations to protect the network against major catastrophes or disasters. The Network Supervisor performs the following functions:

- Controls user login and verifies the network user's name and password against the Master User Directory.
- Determines the optimal available "path" and establishes a virtual circuit through the network for each session, from the point of origin to the point of termination.
- Collects accounting information for each virtual circuit built in the network and stores it in a disk file.
- Performs realtime diagnostics, receives error messages from all the network nodes and interfaces, and stores this information on a disk file. A special process allows a network operator to inquire about the condition of all nodes and hosts on the network and their associated circuits, and allows a user to monitor error information in realtime.

Nodes that provide access to user terminals on TYMNET are called *TYMSATs.* They support a wide variety of asynchronous ASCII devices, several non-ASCII asynchronous terminals (i.e., IBM 2741), and synchronous terminals using the IBM 3270 Bisync, CCITT X.25, IBM 3270 SDLC, or IBM 2780/3780/HASP Bisync protocols. Terminals can be connected to the TYMSATs by dial-up or leased lines, or with local EIA RS-232-C cables. Most TYMSATs are public facilities shared by many users; however, some are dedicated to individual customers who need a permanent connection for several terminals at one location.

TYMCOMs are used to connect user host computers to the network. They can have either asynchronous connections to the host or synchronous connections using IBM 3270 Bisync, CCITT X.25, IBM 3270 SDLC, or IBM 2780/3780/HASP Bisync protocols. *Synchronous Network Interfaces (SNIs)* are becoming more and more popular. The most popular of these is X.25, an international standard. TYMNET has an active X.25 certification program and currently supports the X.25 software packages of more than 65 vendors.

Network Interfaces

TYMNET supports a variety of communications protocols at the terminal and host levels, including asynchronous, ▷

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HOST INTERFACE PROTOCOLS	Asyn-chronous	Polled Async	3270 Bisync	X.25	3270 SDLC	RJE/HASP	2946	VIP 7700
TERMINAL PROTOCOLS								
Asynchronous	X		X	X	Q4 '84		X	X
Polled Async		X						
3270 Bisync	X		X	X	Q4 '84			
X.25	X		X	X	Q4 '84			
3270 SDLC	Q4 '84				X			
RJE/HASP	Half Duplex				Half Duplex	X		
2946							X	
VIP 7700								X

Table 2. TYMNET Network Interfaces

▻ polled asynchronous, 3270 Bisync, X.25, 3270 SDLC, and RJE/HASP. In addition, the network offers many translation services between hosts and terminals using incompatible protocols (see Table 2, OL20-927-205).

Asynchronous terminals are supported by a variety of public and dedicated facilities based on TYMSAT nodes. The following access methods are supported on TYMNET for the connection of asynchronous terminals.

Public Local Dial-up—More than 10,000 public dial-up ports are distributed throughout the country. In these areas, asynchronous terminal access can be made with a low-cost, local telephone call. A user needs only an asynchronous terminal, a compatible modem, and a telephone connection. Generally, all character mode ASCII asynchronous terminals are supported; however, some block mode terminals (i.e., Tymshare 470 and IBM 3101) and some non-ASCII terminals (e.g., IBM 2741) are also supported. Asynchronous ASCII terminals can communicate at speeds of up to 2400 bps. Modems must be 300 or 1200 baud Bell-compatible, 1200 baud Vadic-compatible, or 2400 baud CCITT V.22 bis-compatible. Most ports on the network will support the first three modem types. The 2400-baud ports are being installed in major access cities.

Public WATS Dial-up—Users not within the local dialing area of a public TYMSAT node can utilize TYMNET's toll-free In-WATS number. With WATS, a terminal user does not incur charges for the telephone connection. Charges are billed to the owner of the host user name as a connect hour surcharge, for which, the customer may rebill the terminal user if desired.

Private Dial-up and Leased-line Ports—A customer with a high volume of local usage or a need to control the availability of service may elect to reserve one or more asynchronous ports for private use. These ports may be distributed on one or several TYMSAT nodes, and may support either dial-up (with or without a rotary) or leased lines. A flat monthly rate is incurred in lieu of hourly connect time charges, although other charges, such as character transmission, still apply.

To further simplify network access, a customer whose users always access the same host destination may request that the TYMSAT interface perform the network login automatically. The TYMSAT will, through the Network Supervisor, establish a Permanent Virtual Circuit (PVC) between the terminal port and a specific host. Since the login is performed by the TYMSAT, and the user's name and password are preset, additional security is provided to prevent the user from selecting unauthorized services. In the event a connection is broken, the circuit will be automatically rebuilt by the TYMSAT.

Dedicated Terminal Interfaces (DTIs)—In locations with concentrated high-volume traffic, the customer can elect to use an Asynchronous Terminal Concentrator (ATC) with 4 to 16 asynchronous ports or a Dedicated Terminal Interface with 8 to 128 asynchronous ports. Terminal connections can be hard-wired, leased-line, or dial-up. If more than one line is used, the connection can be split between two or more nearby public nodes to add reliability. TYMNET's Sync Dial Back-up Option allows the customer with a single leased line to back up the connection with a pair of dial-up lines. Additional equipment is provided to support the switchover in the event of a line failure.

Dedicated Customer Facilities (DCFs)—A user with both a Dedicated Terminal Interface and a host interface can configure the ATC or DTI as a Dedicated Customer Facility (DCF) by connecting it directly to the host interface with a leased line. All TYMNET value-added network features are provided on this direct connection. The Sync Dial Back-up Option and the addition of a second leased line to another node for backup is available. A key advantage for high-volume users is that there are no connect hour nor separate character transmission charges for traffic from terminals to hosts connected via the DCF. Usage is billed at $0.25 per hour or $0.25 per call.

TYMNET's Polled Async Service supports multidrop point-of-sale inquiry devices used for applications such as credit verification. Typically, terminals used for polled async are intelligent, down-line loaded point-of-sale devices with integral magnetic card readers, 16-position alphanumeric LED displays, four special function indicators, and 16-key keypads. Bell 202T-equivalent modems are built into each terminal and provided for each terminal port for direct connection to multidrop leased lines.

The Asynchronous Host Interface offers the simplest connection to the network by a host computer. Each Async Host Interface emulates a bank of asynchronous auto-answer modems with a flexible set of configuration param- ▻

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eters, supporting 8 to 128 asynchronous host ports. Lines can run at speeds of 110 to 4800 baud over EIA RS-232-C cables, using the ASCII character set.

IBM Compatible Network Services—offers a number of versatile network services for users of IBM, BSC, or SDLC hosts. This includes the IBM mini and mainframe hosts—System 360/370, 30XX, 8100, 43XX, and System 34/36/38.

Async to Sync Services—Async to 3270 emulation allows async terminals or personal computers with communications software packages operating in character mode terminal (CMT) or block mode to access 3270 applications. This service is available to either BSC or SDLC hosts. The async terminals appear as standard 3270's family terminals to the host.

Sync Services—Tymnet currently supports both BSC and SDLC protocols on the Public Network. Tymnet services are available to users of IBM hosts and they do not have to make any modifications to their existing IBM terminals and hosts. Tymnet Native Mode service does not require the installation of NPSI and NIA, but interfaces directly to standard IBM telecommunications software and hardware.

Tymnet's *SDLC Service* supports the interconnection of devices and hosts that communicate using IBM's Synchronous Data Link Control (SDLC) protocol under the IBM Systems Network Architecture (SNA). No changes are required to either terminal equipment or host systems. Using Tymnet's SDLC Service, terminals connected to separate SDLC Interfaces on the network can be consolidated to appear as single or multiple units to one host.

User interaction is not required to build or maintain the connection from terminal to host. The connection is implemented automatically using the network's Permanent Virtual Circuit (PVC) feature. A separate facility is provided with SDLC interfaces to allow a customer to retarget the PVC for any specific terminal cluster. This facility, called the SDLC System Monitor, can be accessed through the network using an asynchronous terminal. It provides the user with status information about each physical link, as well as the ability to diagnose or shut the interface.

For greater network efficiency, the SDLC interface performs polling and protocol handling locally at each link end, sending only information with no SDLC framing over the network. Devices presently supported include family members of the IBM 3270 Series, 3600 Series, 3770 Series, 5250 Series, and the 8775. IBM hosts supported include the 370 Series with 37XX, front ends, Series 1, 8100 Series, System 32, System 34, and System 38.

The *3270 Bisync Interface* allows the 3270 terminal user to access both host computers with 3270 Bisync support and interactive async ASCII host computers through TYMNET. The interface also allows users of certain types of async ASCII CRTs to access host computers with 3270 Bisync support, and supports ASCII printer functioning as 3270 printers.

A 3270 terminal connected to the TYMNET network can access a wide variety of hosts and applications independently of host software restrictions. The 3270 Bisync Interface increases the versatility of 3270 terminals by eliminating the need for multiple terminals at the user's site.

All the capabilities of the 3270 Bisync Interface are available without hardware or software changes to the host computer. The 3270 Bisync Terminal and Host Interfaces run in separate "job slots" on TYMNET nodes. The Host Interface can appear as one or more 3270 Bisync control units on a Bisync line to the 3270 host. The Host Interface provides local control of terminal polling, device selection, and packet acknowledgement.

The 3270 Bisync Host and Terminal Interfaces may be used in native mode to replace leased lines between hosts using 3270 Bisync Protocol and 3270—compatible terminals. This allows the sharing of network facilities between diffferent 3270 applications, or between 3270 applications and batch Bisync. The 3270 terminals that are connected to the 3270 Bisync Terminal Interface may be used in place of async ASCII terminals to access network host computers through asynchronous host interfaces.

The *RJE/HASP Host and Terminal Interfaces* provide access to customer hosts through TYMNET via IBM-compatible 2770, 2780, 377X, and 3780 remote batch terminals operating in the Bisync point-to-point or SDLC mode. No hardware or software changes are required at the host or terminal end. Leased or hardwired host ports and leased or dedicated dial-up terminal port connections are supported.

The *TYMNET X.25 Interface* allows compatible hosts to access TYMNET's data transmission services and is fully compatible with recognized international standards. The X.25 Interface operates with the data processing systems of most major computer manufacturers. Currently, more than 50 vendors' products have been certified on TYMNET, and an ongoing X.25 product certification program is adding more to the list each month.

Study Group VII of the CCITT adopted X.25 as an international standard in 1976. Recognizing that it is not possible for all computer vendors or customers to update immediately to the latest version of the standard, TYMNET offers several options that provide compatibility with earlier versions of the standard.

The X.25 Interface connects either host or terminal equipment to TYMNET. It can also be used to connect a private network, including Local Area Networks (LANs), to the public network. A full-duplex, synchronous data link is required for connection and may be used with leased lines, dedicated dial-up ports, or leased lines with Sync Dial Back-up. Lines can have a maximum speed of 56K baud using CCITT standard HDLC, and a maximum speed of 9600 baud using Bisync framing. Bisync can be used with the V.24 Electrical Interface, while HDLC supports both V.24 and V.35.

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Host Interface Charges

Asynchronous Host Interface Services: The following table shows the rates for various types of asynchronous interfaces (Tymcoms) that support one or more hosts.

Interface Type	Number of Ports	Monthly Rate ($)	Installation Fee ($)
AHI-8	8	300	100
AHI-16	16	600	200
AHI-32	32	1,100	300
AHI-48	48	1,250	350
AHI-64	64	1,400	400
AHI-80	80	1,550	450
AHI-96	96	1,700	500
AHI-112	112	1,850	550
AHI-128	128	2,000	600

Synchronous Host Interface Services: The following rates apply for the connection to Tymnet of host or communications processor systems using a synchronous protocol (e.g., X.25, bisync, 3270 bisync, SDLC, RJE/HASP).

Interface Type	Monthly Rate ($)	Installation Fee ($)
*SHI-X25B (X.25 Bisync)	300	750
*SHI-X25H (X.25 HDLC)	300	750
**SHI-3270B (3270 Bisync)	400	750
SHI-3270S (3270 SDLC)	300	750
SHI-SDLC (SDLC)	300	750
SHI-RJEB (RJE/HASP Bisync)	300	750
SHI-BSC (Bisync)	300	750

**3270 terminal emulation for character mode terminal (TEM-CMT) is an option that requires DSP support by the host. TEM-CMT costs $400 per month, plus a $400 installation fee if not installed concurrently with the synchronous host interface.*

***3270 terminal emulation for block mode terminals only (TEM-BLK) and 3270 terminal emulation for block and character mode terminals (TEM-BAC) are optional. TME-BLK costs $200 per month; no installation fee applies. TEM-BAC costs $300 per month; the installation is $400 if not installed concurrently with the synchronous host interface.*

Terminal Interface Charges

Tymnet terminal interfaces are either asynchronous or synchronous. Charges include necessary cables and full period maintenance.

Asynchronous Terminal Interface Services: Asynchronous facilities for local access are provided by the customer or by Tymnet at the following rates:

Interface Type	Number of Ports	Monthly Rate ($)	Installation Fee ($)
ATI-8	8	150	100
ATI-16	16	300	200
ATI-32	32	500	300
ATI-48	48	750	350
ATI-64	64	1,000	400
ATI-80	80	1,250	450
ATI-96	96	1,500	500
ATI-112	112	1,750	550
ATI-128	128	2,000	600

Asynchronous Terminal Concentrator (ATC) service. Facilities for local access can be provided by the customer or by Tymnet at the following rates:

Interface Type	Number of Ports	Monthly Rate ($)
ATC-4	4	900
ATC-8	8	1,000
ATC-12	12	1,200
ATC-16	16	1,300

The ATC installation fee is $900. A high-speed network connection costs $250 per month. Dial Back-up costs $200 per month and $750 to install.

Transmission Charges

For data transmitted at any speed between locations in the U.S., the following charges apply from 7 a.m. to 6 p.m. during business days:

Kilocharacters Per Month	Charge Per Kilocharacter ($)
First 50,000	0.05
Next 50,000	0.03
Next 100,000	0.02
Over 200,000	0.01

During off-peak hours (6 p.m. to 7 a.m. on business days, plus holidays and weekends), the charge per 1000 characters is $0.005.

Terminal Access Charges

Public Dial-In Ports (Asynchronous 110 to 2400 bps): The following peak-time hourly charges apply during the hours of 7 a.m. to 6 p.m. on business days, according to local time at the originating Tymnet node location.

Hours Per Month	Peak Time Hourly Rate ($)	Off-Peak Time Hourly Rate ($)
First 1,000	4.25	1.50
Next 1,000	3.25	1.50
Next 3,000	2.50	1.50
Over 5,000	2.00	1.50

In addition, the following hourly surcharges apply for access from cities classified as Medium and Low Density and for WATS access.

	Peak Time Hourly Surcharge ($)	Off-Peak Hourly Surcharge ($)
Medium Density	2.50	0.75
Low Density	7.00	2.25
WATS	18.75	15.00

Off-peak time is from 6 p.m. to 7 a.m. on business days, and all day on holidays and weekends.

Private Access Port Charges (Asynchronous) follow:

Dial-Up Service	City Density	Transmission Speed (bps)	Monthly Rate ($)
PAP-HD	High	110-1200	250
PAP-MD24	Medium	2400	450
PAP-MD	Medium	110-1200	400
PAP-HD24	High	2400	250

Table 3. Pricing information for TYMNET network services as of November 1984

Leased Line Service	City Density	Transmission Speed (bps)	Monthly Rate ($)
PAP-HL	High	110-1200	200
PAP-ML	Medium	110-1200	350
PAP-ML24	Medium	2400	375
PAP-HL24	High	2400	250

A $500 installation charge applies and includes the installation of the leased line.

TINET Polled Terminal Service is available from High and Medium Density locations. Port charges are as follows:

Interface Type	City Density	Monthly Rate ($)	Installation Fee ($)
APT-HF (first port)	High	350	600
APT-HA (each additional port, same location)	High	225	200
APT-MF (first port)	Medium	550	600
APT-MA (each additional port, same location)	Medium	425	200

Network Connection Charges

Network Connection	Monthly Rate ($)
NC-24 L (Leased line, 2400 bps)	800
NC-48 L (Leased line, 4800 bps)	900
NC-96 L (Leased line, 9600 bps)	1,200
NC-144L (Leased line, 14.4K bps)	1,500
Dial Back-up	200

Minimum Session Charges

Customers who use public access ports are charged for the following minimum number of minutes per session for various types of network interfaces.

Interface Originating Call	Session Minimum
High Density	2.5 minutes
Medium Density	2.0 minutes
Low Density	1.5 minutes
WATS	1.5 minutes
Leisure-Tyme	2.5 minutes ■

Table 3. Pricing information for TYMNET network services.

The *3270 Bisync Terminal and Host Interfaces* may be used to connect, via X.25 links, to hosts that support the Display System Protocol (DSP). They may also be used to communicate via X.75 gateways with hosts or terminals on other networks, if they also provide DSP support. Support is provided by Comm-Pro Associates for the IBM 370x front ends to IBM 370 Series hosts on TYMNET.

Network Security

Tymnet assures the integrity and privacy of data with procedural techniques and controls. TYMNET's login sequence requires a user name and password, that are checked against a specially encoded central file for validation by the Supervisor before a circuit is established. Tymnet customers control their own user names and passwords for maximum privacy. In addition, the Closed User Group capability allows the user to limit terminal access to specified hosts and from specified parts of the network. If a customer needs to access only one system, the Permanent Virtual Circuit (PVC) capability can be requested to provide automatic access to only that particular system. As a further safeguard to network security, the Network Supervisor monitors incorrect and spurious login requests.

For data transmission, variable-length packets containing data from many users is multiplexed into one character stream. Routing is established during login by internal messages, excluding actual destination host names and numbers from the packet. The cryptic nature of TYMNET technology makes it extremely difficult for someone to decipher user data during transmission.

Network Reliability

TYMNET features built-in network error detection and retransmission procedures. In the event of leased line or communications processor failure, TYMNET automatically provides alternative routing to bypass the failed element. During a line outage, the continuation of service is ensured by the use of synchronous dial backup equipment, allowing the customer to switch to dial-up lines until the leased line is restored.

Network Management

TYMNET's Network Control Center is located in San Jose, CA, and is manned 24 hours a day, seven days a week. The Center's operators monitor and control all lines, ports, and nodes in the network. They also coordinate and dispatch maintenance when required, and compile network statistics to ensure efficient network operation and growth.

Net Alert is Tymnet's information service that informs users about network access conditions. By using the OnTyme electronic message service, Net Alert provides prompt notification whenever network access problems exist, or when planned maintenance might affect access. Net Alert subscribers are also notified when the service is restored, delivering the message to the user's auto-answer terminal.

Net Alert, in conjunction with OnTyme, offers two-way communications capabilities, allowing users to report difficulties and to automatically receive a written record of each message sent.

Net Patrol is a service offered to customers who intend to manage their own facilities or require continual status reports about their network. Net Patrol gathers all network status information from the active Network Supervisor and routes the appropriate data to each user.

Tymnet, Inc.

▻PRICING INFORMATION

Usage costs, in addition to connect-time charges, include charges for the host interfaces, volume of characters transmitted, terminal interfaces, and customer accounts, and user names. Current business-day transmission charges, during peak hours, range from $0.05 per 1,000 characters for the first 50,000 characters per month to $0.01 per 1,000 characters for over 200,000 characters per month. (This compares to a previous rate of $0.04 per 1,000 characters, regardless of volume.) The off-peak charge is $0.005 per 1,000 characters.

Table 4 (OL20-927-207) contains the rates for various interface, access, and transmission charges for the services offered by Tymnet.

Each customer is charged $100 a month for detailed accounting records, that will be supplied in printed form, if requested. This $100 charge includes the Tymnet invoice for network services during the month. Accounting reports supplied on tape cost $200 per month. In addition, a monthly charge of $4 applies for each valid Tymnet user name obtained by the customer.

The two basic types of host interfaces to Tymnet are asynchronous and synchronous. Charges for both types of interfaces include full-period maintenance and leased access channels to Tymnet. Direct terminal access is offered through public dial-in ports and through private ports. Tymnet also offers various flat rate plans for interfacing multiple dedicated terminals. The use of public dial-in ports incurs an hourly charge. The other types of terminal interfaces are available on a monthly basis without hourly charges.

For customers with substantial off-peak usage, a Leisure-Tyme billing option offers an hourly rate of $0.90 for all off-peak hours. This rate applies to up to 100 kilocharacters per hour. Excess characters and the use of WATS access are billed at standard off-peak rates and do not contribute to the required monthly minimum charge of $5,000. The minimum monthly service period for Leisure-Tyme is three months.

Network connections are available between the customer location and the nearest Tymnet node, and between multiple customer locations. Full period maintenance is included. The installation fee is $250 if installed concurrently with Customer Premises Equipment or Synchronous Host Interfaces; if not, the installation fee is $500. Dial Back-up costs $750 to install.

The network connection between a dedicated terminal interface and Tymnet is a leased line. If the dedicated terminal interface is connected to another of the customer's dedicated interfaces, Dedicated Customer Facility billing options are available. These options apply only for sessions to predesigned host computers that connect to the same dedicated Tymnet equipment.

The Dedicated Customer Facility options do not entail a charge for transmission of a certain number of characters. If the dedicated terminal interface is connected with a synchronous network interface, then a synchronous network interface usage charge of $0.05/K characters also applies.

Customers who use private access ports, dedicated terminal interfaces, synchronous host interfaces, or synchronous polled terminal ports are charged for a minimum transmission (input and output) of 6 kilocharacters per session. Charges are based on standard peak-time or off-peak rates. No minimum is applied to asynchronous polled ports.

OTHER SERVICES

Tymnet provides customers of the public network the opportunity to operate dedicated TYMNET components as distinct private networks or in combination with the public network service. Tymnet provides private network customers the same proven technology and control that is deployed on the public network. The company conducts an in-depth analysis of the customer's requirements and customizes a network to meet those needs. As the user's communications requirements increase, the user's network can be expanded to accommodate them.

In conjunction with Tymshare's electronic message service, OnTyme, Tymnet offers a service that can automatically dial out from the network to a customer's terminal and deliver electronic mail. Dubbed *Outdial,* the service can support up to 12 modems simultaneously. Calls can be placed to remote terminals with either Bell 103J- or Bell 212A-compatible auto-answer modems. Three Outdial systems are currently installed in TYMNET. Each month, these three systems handle more than 100,000 telephone calls, transmitting approximately 75 million characters.

FUTURE PLANS

Tymnet will be expanding its 2400 bps asynchronous dial-up transmission service from 55 cities to include more than 100 cities by the end of 1985. Tymnet was the first network to provide 2400 bps access.

X.PC, an advanced communications protocol developed by Tymnet, provides value-added network services to personal computers. Scheduled for full release in mid 1985, X.PC is an error-correcting, asynchronous protocol with the ability to handle up to 15 simultaneous logical channel sessions over a single physical link. Joint ventures with several PC software and hardware vendors will be announced by mid 1985.

With the proposed deregulation of the Japanese telecommunications industry expected to become effective April 1985, Tymnet is positioned to make major inroads into Japan's value-added services market. Tymnet is the first U.S. company to enter the Japanese VAN market, via a joint venture with the Marubeni trading company. The new VAN will be known as Japan Network Ltd. and will encompass the latest in Tymnet telecommunications and data transmission technology. ☐

US Telecom Data Communications Company

COMPANY INFORMATION

US Telecom Data Communications Company
10951 Lakeview Avenue
Lenexa, Kansas 66219
Telephone (913) 541-4400

Company Background

US Telecom Data Communications Company (formerly Uninet, Inc.) is a business unit of US Telecom. The company operates one of the largest value-added, packet-switching networks in the world (UNINET), supporting interactive asynchronous data communications at speeds from 110 to 2400 bps, and synchronous operations at speeds from 2400 to 19.2K bps.

The UNINET network was developed as a private network for United Information Services, Inc. It became available commercially in March 1981.

UNINET currently provides access to over 500 cities throughout the United States (see Figure 1, Page OL20-946-102) and 48 international services worldwide (see Figure 2, Page OL20-946-103). The network supports all aspects of business communications, including voice, facsimile, digital data, and teleconferencing.

The UNINET Public Data Network offers an enhanced version of the X.25 data communications standard recommended by the International Telegraph and Telephone Consultative Committee (CCITT), which provides a highly reliable and efficient method of transferring data between a terminal and host, or between two hosts. This service also includes modifications in the network and host sign-on procedures allowing greater ease of access. The upgrade has increased throughput to provide the user with faster response time.

Accessing the UNINET network is accomplished by means of public dial-up access ports; private dial-up and leased access ports; and a Terminal Packet Assembler/Disassemblers (TPAD) facility. Each of these access methods supports interactive asynchronous service from 110 to 2400 bits per second (bps).

In January 1986, GTE Corporation and United Telecommunications Inc. announced the signing of a letter of intent to form a partnership. The partnership would merge their long-distance telephone units, GTE Sprint and US Telecom, and their data communications subsidiaries, GTE Telenet and US Telecom Data Communications Company. The resulting company, which will be equally owned by GTE and United Telecom, will be called US Sprint Communications Company. As of mid May 1986, it looked like the new company would receive the necessary legal and regulatory approvals in time to begin formal operations by July 1, 1986.

US Telecom Data Communications Company (formerly Uninet, Inc.), operates one of the largest international value-added data communications networks—UNINET. UNINET provides access for over 500 U.S. domestic metropolitan areas and 48 foreign countries.

Customer host connections are either asynchronous, X.25, SDLC/SNA, or Bisync. UNINET supports interactive, low-speed, asynchronous data communications at transmission speeds of 110, 300, 1200, and 2400 bps. Synchronous data communications are supported at speeds of 2400 and 4800 bps for dial-up connections, 9600 for synchronous dial-up connections, and 19.2K and 56K bps for dedicated connections. Synchronous SDLC/SNA, Bisync, and X780 hosts interface to the network at speeds of 2400 through 19.2K bps.

UNINET also offers the Microcom Networking Protocol (MNP), accommodating data transmission between data terminals, personal computers, microcomputers, or mainframes at speeds of up to 2400 bps. UNINET supports a variety of international protocols, including X.3, X.25, X.28, and X.29. Automatic host sign-on permits users to send host sign-on data at the same time that they choose a host. UNINET provides Packet Assembly/Disassembly (PAD) functions that enable asynchronous devices to connect to the network.

Competitive Position

As mentioned, the planned merger between GTE Sprint and US Telecom (creating US Sprint Communications Company) would mean that the Telenet and UNINET data networks would be combined. The data network resulting from the merging of Telenet and UNINET will be formidable indeed. Up until now, Telenet had about a 27 percent share of the market for packet-switching services; UNINET had about a 14 percent share (close competitor Tymnet had about a 25 or 26 percent share). In addition, the Telenet packet switched network served over 400 cities in the U.S. and 67 foreign countries, while UNINET served 100 additional U.S. cities and 10 other countries. The new network will therefore serve more than 500 U.S. cities and nearly 80 foreign countries. While Tymnet (and for the database market, networks such as DIALOG's Dialnet) will continue to offer competition, the new meganetwork will easily control the market.

US Sprint Communications Company will be particularly strong in the area of fiber optics, and is planning to operate an all-digital nationwide network. By the end of this year,

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ALABAMA
Bessemer
Birmingham
Mobile
Montgomery

ARIZONA
Glendale
Mesa
Phoenix
Scottsdale
Tempe
Tucson

ARKANSAS
Little Rock

CALIFORNIA
Alhambra
Anaheim
Arcadia
Bakersfield
Belmont
Berkeley
Beverly Hills
Burbank
Canoga Park
Colton
Compton
Concord
Covina
Downey
El Monte
El Segundo
Fremont
Fresno
Fullerton
Glendale
Hayward
Hollywood
Huntington Beach
Inglewood
Long Beach
Los Altos
Los Angeles
Mar Vista
Monrovia
Monterey
Mountain View
Newport Beach
Norwalk
Oakland
Ontario
Oxnard
Palo Alto
Pasadena
Pomona
Redwood City
Richmond
Riverside
Sacramento
San Carlos
San Diego
San Francisco
San Jose
San Leandro
San Mateo
San Pedro
Santa Ana
Santa Clara
Santa Monica
Stockton
Sunnyvale
Vallejo
Van Nuys
Ventura
Walnut Creek

COLORADO
Arvada
Aurora
Boulder
Colorado Springs
Denver
Grand Junction
Lakewood

CONNECTICUT
Bloomfield
Bridgeport
Danbury
Greenwich
Hartford
Milford
New Britain
New Haven
New London
North Haven
Stamford
Waterbury
West Hartford

DELAWARE
Wilmington

DISTRICT OF COLUMBIA
Washington

FLORDIA
Boca Raton
Cape Canaveral
Clearwater
Daytona Beach
Fort Lauderdale
Fort Myers
Gainesville
Hialeah
Hollywood
Jacksonville
Melbourne
Miami
Miami Beach
Naples
Orlando
Saint Petersburg
Sarasota
Tallahassee
Tampa
West Palm Beach

GEORGIA
Atlanta
Marietta
Savannah

ILLINOIS
Arlington Heights
Aurora
Bloomington
Champaign
Chicago
East St. Louis
Elgin
Evanston
Joliet
Oak Park
Peoria
Rock Island
Rockford
Skokie
Springfield
Urbana
Waukegan

INDIANA
Evansville
Fort Wayne
Indianapolis
Mishawaka
Osceola
South Bend

IOWA
Ames
Cedar Rapids
Council Bluffs
Davenport
Des Moines

KANSAS
Kansas City
Overland Park
Shawnee Mission
Topeka
Wichita

KENTUCKY
Lexington
Louisville

LOUISIANA
Baton Rouge
Lafayette
Metairie
New Orleans
Shreveport

MAINE
Augusta
Bangor

MARYLAND
Baltimore
Bethesda
Dundalk
Rockville
Silver Springs
Towson

MASSACHUSETTS
Andover
Arlington
Boston
Brookline
Cambridge
Holyoke
Lexington
Lynn
Medford
Newton
Northampton
Quincy
Somerville
Springfield
Waltham
Worcester

MICHIGAN
Ann Arbor
Dearborn
Detroit
Flint
Grand Rapids
Grosse Pointe
Jackson
Kalamazoo
Lansing
Livonia
Muskegon
Plymouth
Royal Oak
Saginaw
Southfield
St. Clair Shores
Sterling Heights
Taylor
Warren
Westland

MINNESOTA
Bloomington
Minneapolis
St. Cloud
St. Paul

MISSOURI
Bridgeton
Columbia
Creve Coeur
Florissant
Independence
Jefferson City
Kansas City
Liberty
Saint Louis

NEBRASKA
Lincoln
Omaha

NEVADA
Las Vegas
Reno

NEW HAMPSHIRE
Concord
Hanover
Merrimack

NEW JERSEY
Atlantic City
Bayonne
Branchburg
Camden
Carteret
Cherry Hill
East Orange
Edison
Elizabeth
Fords
Jersey City
Morristown
New Brunswick
Newark
Oradell
Passaic
Paterson
Piscataway
Princeton
River Edge
Roseland
Somerville
Trenton
Union City
Woodbridge

NEW MEXICO
Albuquerque

NEW YORK
Albany
Babylon
Buffalo
Cheektowaga
Hicksville
Huntington
Ithaca
Latham
Mineola
Mount Vernon
New Rochelle
New York City
Plainview
Rochester
Schenectady
Syracuse
Town of Tonawanda
Troy
White Plains
Yonkers

NORTH CAROLINA
Chapel Hill
Charlotte
Davidson
Durham
Greensboro
Raleigh
Research Triangle
Tarboro
Winston-Salem

NORTH DAKOTA
Bismarck

OHIO
Akron
Brook Park
Canton
Cincinnati
Cleveland
Columbus
Dayton
Euclid
Hamilton
Kent
Parma
Toledo

OKLAHOMA
Bartlesville
Bethany
Britton
Norman
Oklahoma City
Tulsa

OREGON
Hood River
Portland

PENNSYLVANIA
Allentown
Bethlehem
Blue Bell
Carlisle
Danville
Harrisburg
Hershey
King of Prussia
Lancaster
Penn Hills
Philadelphia
Pittsburgh
Reading
Upper Darby
Valley Forge
York

RHODE ISLAND
Pawtucket
Providence
Warwick

SOUTH CAROLINA
Columbia

SOUTH DAKOTA
Rapid City
Sioux Falls

TENNESSEE
Bristol
Chattanooga
Knoxville
Memphis
Nashville

TEXAS
Amarillo
Arlington
Athens
Austin
Beaumont
Bryan
College Station
Corpus Christi
Dallas
Fort Worth
Garland
Grand Prairie
Houston
Irving
Lackland
Pasadena
Port Arthur
San Antonio
Tyler

UTAH
Salt Lake City

VERMONT
Rutland

VIRGINIA
Alexandria
Annandale
Arlington
Charlottesville
Chesapeake
Covington
Fairfax
Falls Church
Hampton
Lynchburg
Newport News
Norfolk
Portsmouth
Richmond
Roanoke
Springfield
Vienna
Virginia Beach

WASHINGTON
Bellevue
Bellingham
Everett
Seattle
Spokane
Tacoma

WEST VIRGINIA
Charleston
Huntington

WISCONSIN
Appleton
Brookfield
Green Bay
Madison
Milwaukee
Racine
Sheboygan
Sun Prairie

WYOMING
Laramie

Figure 1. Uninet X.25 access locations

Argentina
Australia
Austria
Bahrain
Barbados
Belgium
Bermuda
Brazil
Canada
China
Columbia
Denmark
Dominican Republic
Finland
France
French Antilles
Gabon
Greece
Guadeloupe
Hong Kong
Hungary
Ireland
Israel
Italy
Ivory Coast
Japan
Korea
Kuwait
Luxembourg
Martinique
Mexico
The Netherlands
New Zealand
Norway
Philippines
Portugal
Puerto Rico
Qatar
Reunion Island
Saudi Arabia
Singapore
South Africa
Spain
Sweden
Switzerland
Taiwan
United Arab Emirates
United Kingdom
Virgin Islands
West Germany

Figure 2. Uninet international service

the new company hopes to have 14,200 miles of fiber-optic cable in place. This will enable it to provide digital services to more than 80 percent of the nation's population.

NETWORK DESCRIPTION

UNINET, the public data network, is a shared, packet switched network available nationwide, interfacing with public networks outside the continental United States through International Record Carriers (IRC). The network architecture allows the offering of terminal-to-host connections, microprocessor-to-host connections, and host-to-host connections. X.25 host connections are available over permanent, four-wire leased circuits at speeds up to 9.6K bps, or over dial-up, two-wire, full-duplex circuits (see Figures 3 and 4).

The UNINET network consists of an internal, four-level, regionalized system. The regionalized nature of the system permits efficient data transportation and modular expansion of the network. The four-level nature of the network allows for distributed functionality, local switching, protocol conversion, high-speed data transportation, and growth in terms of product offerings and access locations. The four levels are as follows:

- *Interregional Switches (RSW)*—provides region-to-region data switching. Each region contains both multiple RSWs and multiple high-speed links to each and every other region. Regions are added to the network based on growth and communities of interest. The interregion links are currently 56 kilobits per second (K bps) digital facilities that provide a fast, low error rate transmission path. The RSWs are minicomputers running proprietary software that have been optimized for packet switching performance. The RSWs also provide routing information, performance statistics, and operator control. They are connected by 56K bps digital links to multiple intraregional switches within each region.

- *Intraregional Switches (ISW)*—provides local switching within a region and acts as a gateway to the RSWs. Each ISW is connected to multiple RSWs and other ISWs within its region. ISW-to-ISW links vary in speed from 19.2K bps to 56K bps, depending on traffic load, location, and redundancy of the various nodes. Also, the ISWs provide data path concentration for interconnect nodes, routing information, performance statistics, and a network control system interface. The ISWs are connected to the interconnect nodes by multiple links operating at speeds of 16K bps to 56K bps. The link speed is determined by the network topology and traffic load.

- *Interconnect Nodes (ICN)*—provides an interface between the internal switching network and the X.25 public network interface. Each ICN is connected to multiple ISWs to increase reliability and level traffic flow. The ICN is instrumental in call setup and clearing for any virtual circuit through the network. It provides a CCITT X.25 interface to the external world and allows local switching, data path concentration, and X.25 host monitoring. In addition to these tasks, the ICNs accumulate network usage information and performance statistics. ICNs may be connected directly to hosts or to user-provided PADs through an X.25 synchronous connection, or connected to the UNINET host or Terminal Packet Assembler/Disassembler (TPAD).

- *Packet Assembler/Disassemblers (PAD)*—provides an asynchronous interface to the network. Two types of PADs are provided: Host Packet Assembler/Disassemblers (HPAD) and Terminal Packet Assembler/Disassemblers (TPAD). Both are connected to ICNs through a 9.6K bps X.25 line, and provide 8 or 16 asynchronous ports for connection to terminals or hosts. The microprocessor-based PADs contain a flexible operator control package, that allows for highly secure local and remote access to statistics, configuration information, and modem busy-out functions. The asynchronous speed support range is from 110 bps to 9600 bps.

TPADs are used for public access locations, private dial access, and private dedicated access. They may be configured for Autobaud Rate (ABR) support, Automatic Parity Detect (APD), dedicated speeds, automatic call setup (similar to permanent virtual circuits), or switched virtual circuits. The TPAD supports the full 18 CCITT X.3 parameters as described in the 1980 version. It also supports extended values for the 18 parameters and several additional parameters. The UNINET specific

US Telecom Data Communications Company

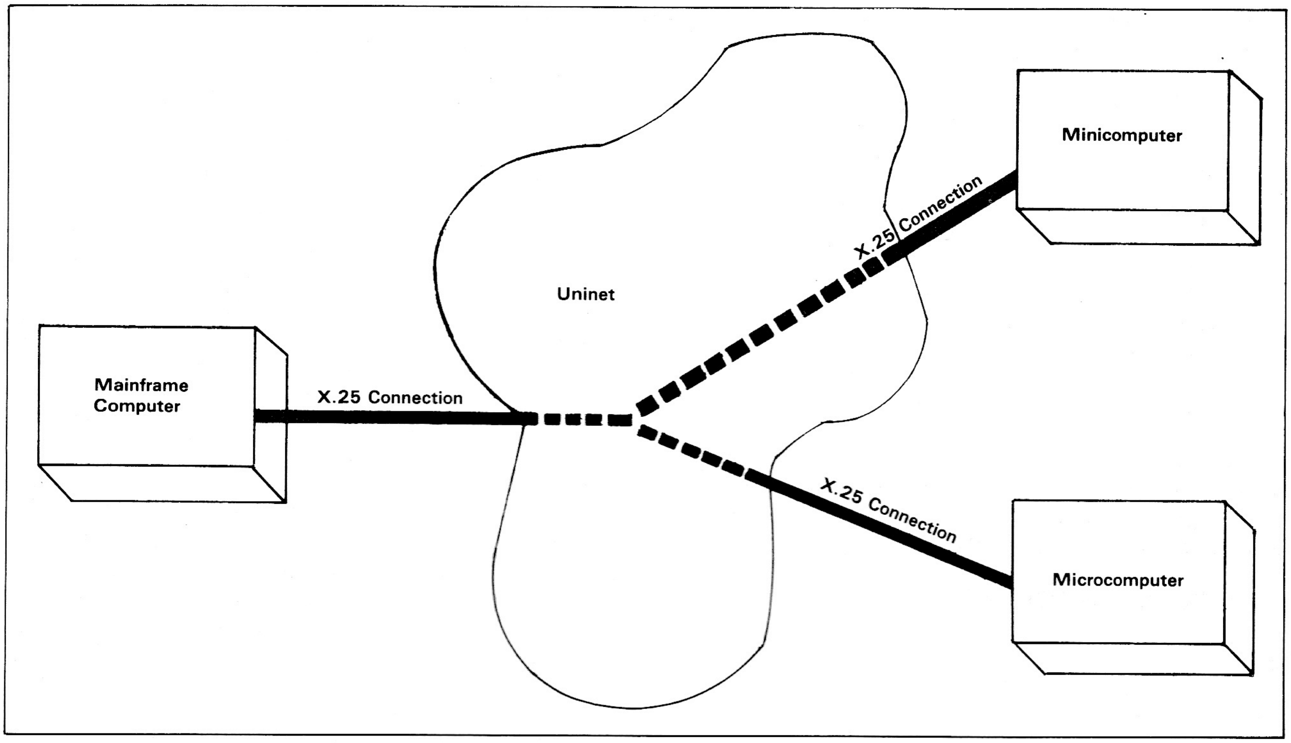

Figure 3. CCITT X.25 (synchronous) Host Connection

parameters include special parity, break key, character editing mode options, network disconnect options, and others. The TPAD supports the X.29 and X.28 standards with user-friendly extensions. The TPAD, at log-on, supports both X.121 addressing and user-friendly mnemonic alphanumeric access codes. It also allows host users additional accounting and security control. Another feature, which occurs at the time of log-on, allows terminal users to pass up to 12 characters of user data to the host. This provides for faster log-ons and custom-host applications. For public access locations, the TPAD is connected to a full-duplex, two-wire ABR modem that supports rates of 100, 300, 1200, and 2400 bps at a single phone number.

HPADs are located at the host site and provide an asynchronous interface to those hosts that do not support X.25. The interface presented to the host appears as if it were connected directly to the terminal. The HPAD accepts and provides to the host a choice of flow control mechanisms: X-on/X-off control and Return To Send/Clear To Send (RTS/CTS) signal control. The HPAD also provides parity conversion, if required, or eight-bit transparency. At call setup time, the HPAD can be configured to perform such functions as three different forms of ring signalling with variable-width pulses, autobaud character generation, absorb host start-up messages, call rotoring, generation of X.29 packets, and generation of host sign-on messages. In addition, HPAD can be programmed to time-out and retry various steps of the host connection process. It is also possible to separate incoming calls into different host groups based on terminal speed, data terminal equipment address, or other call characteristics.

Software for all four levels are fully downline-loadable through the network from the Network Control System located in Kansas City. Actual network operator access for all four levels of network architecture is available through both the network and separate diagnostic ports.

Network Access

Customer terminals and modems connect to UNINET via dial-up and dedicated lines. Customer host connections are either asynchronous, X.25, SDLC/SNA, or Bisync.

With an asynchronous interface, an HPAD is connected to the communications front end on the customer's host computer. Multiple lines running from the HPAD connect to the front end as multiple terminals. At the same time, the HPAD presents a single terminal-type interface to UNINET, thus the network becomes transparent and the transmission appears to the front end to have originated from a local terminal.

When accessing the UNINET network, customers can choose from three methods: public dial-up access ports; private dial-up and leased access ports; and a Terminal Packet Assembler/Disassembler (TPAD) facility. Each of the dial-up methods of access supports asynchronous interactive service at transmission speeds from 110 to 2400 bps, while the leased access method supports service at transmission speeds to 19.2K bps.

The *public dial-up access ports* consist of high-, medium-, and low-density access ports, as well as WATS access ports. City density relates to the volume of UNINET traffic and

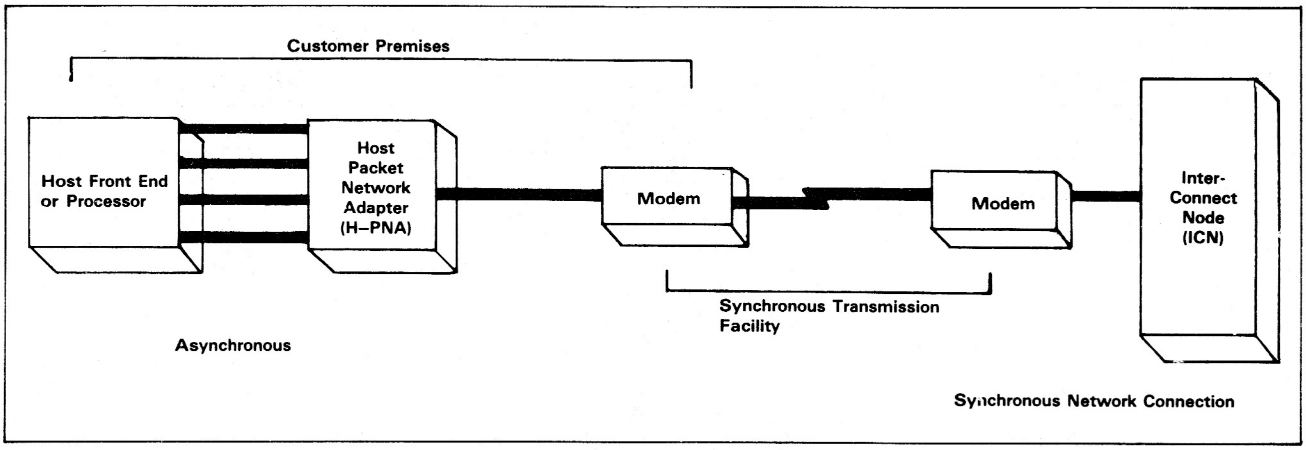
Customer Premises
Host Front End or Processor
Host Packet Network Adapter (H–PNA)
Modem
Modem
Inter-Connect Node (ICN)
Synchronous Transmission Facility
Asynchronous
Synchronous Network Connection

Figure 4. Asynchronous Host Connection

equipment in the city, and determines service price. The following features apply to public dial-up access ports:

- No fixed costs
- Immediate availability (no planning for new service)
- More economical than long-distance dial network

The *private access ports* can be dial-up or leased. The primary feature of the dial-up is restricted access. The telephone number of a private port is known only to the customer and his or her authorized users. Other benefits include:

- Stabilized, known costs
- Low-cost, 24-hour-a-day access for low-traffic volume applications
- Ease of access

The primary features of the private leased access port include a more reliable service than direct dial lines, no dialing, and auto-connect option to the selected host.

The Terminal Packet Assembler/Disassembler (TPAD) facility is offered for customers who have multiple terminals centrally located in one building and wish to avoid the expense and confusion of many individual dial-up lines. The TPAD facility is located at the customer site and allows centrally located terminals to access UNINET directly, or through a Private Branch Exchange (PBX).

IBM Service Connections

US Telecom Data Communications Company also provides 3270 microcomputer-to-mainframe connections using asynchronous dial-up facilities (see Figure 5, Page OL20-946-107). This is accomplished through the use of software residing on the PC and the host computer supporting IBM's Network Packet Switching Interface (NPSI). It allows full 3270 capabilities, as well as PC application processing at inexpensive asynchronous connection rates.

Synchronous SDLC/SNA, Bisync, and X780 hosts interface to the network through a dedicated HPAD located at the host site, and connect directly into an ICN through a synchronous transmission facility at speeds of 2400 through 19.2K bps. In addition, IBM host front-end processors, using IBM's Network Packet Switched Interface (NPSI), allow direct X.25 connections to an ICN through a synchronous transmission facility.

Customer Support Services

US Telecom's network reliability is maintained by the Network Control Center (NCC) located in Kansas City, MO. Using the most sophisticated hardware and software, highly trained technical personnel constantly regulate and monitor the network. The NCC is staffed by technicians 24 hours a day, 7 days a week. Problems that arise can be solved through remote diagnostics, or UNINET technicians located in major cities around the country can be dispatched to the problem site.

An important part of the Kansas City NCC is the Network Control System (NCS). NCS performs network monitoring, which allows for error detection and correction. It also performs software loading and dumping, operator interface reporting, and captures usage statistics that allow research and development personnel to plan for network growth and to enhance existing services.

Several network administrative services are available at the customer's option. The services include account maintenance, host access codes, user IDs, and lock-out. The lock-out service enables a customer to restrict or direct network traffic in various ways by locking out certain types of access from users.

PRICING

US Telecom Data Communications Company provides its customers with a wide range of services and pricing options. The network services are comprised of three major categories: the connection of the customer host to the network; the connection of customer terminals to the network; and data transmission through the network.

	2400/4800/9600 BPS	
DISTANCE	MONTHLY	INSTALLATION
1 mile	$350.00	$450.00
2- 15 miles	400.00	450.00
16- 25 miles	450.00	450.00
26- 40 miles	500.00	450.00
41- 60 miles	550.00	450.00
61- 80 miles	600.00	450.00
81- 100 miles	650.00	450.00
101-1000 miles	650.00+ $1.25/mile over 100 miles	450.00
Over 1,000 miles	$1,775.00 + $0.70/mile Over 1,000 miles	450.00

Table 1. Uninet synchronous transmission facility pricing

	110/300/1200 BPS	
DISTANCE	MONTHLY	INSTALLATION
1 Mile	$275.00	$450.00
2- 15 Miles	325.00	450.00
16- 25 Miles	375.00	450.00
26- 40 Miles	425.00	450.00
41- 60 Miles	475.00	450.00
61- 80 Miles	525.00	450.00
81- 100 Miles	575.00	450.00
101-1000 Miles	575.00 + $1.25/mile over 100 miles	450.00
Over 1,000 miles	$1,700.00 + $.70/mile Over 1,000 miles	450.00

Table 2. Uninet asynchronous transmission facility pricing

The hourly charge for access to Uninet via public dial access ports is based on an hourly charge, depending on whether high-, medium-, or low-density, or WATS access is used. Nonprime Access is also available.

	HOURLY RATE	MNP 300-2400
1. Prime Time Access		
high density	$ 3.50	$ 4.00
medium density	6.50	7.50
low density	9.50	10.50
2. Nonprime Access with no minimum usage		
high density	$ 1.75	$ 2.25
medium density	3.25	3.75
low density	4.75	5.25
3. Nonprime Access with $5,000.00 minimum usage commitment (monthly)		
high, medium, low density	$ 1.10	$ 1.60
4. WATS Access	$23.00	$24.00

Table 3. Uninet public dial-up access ports pricing

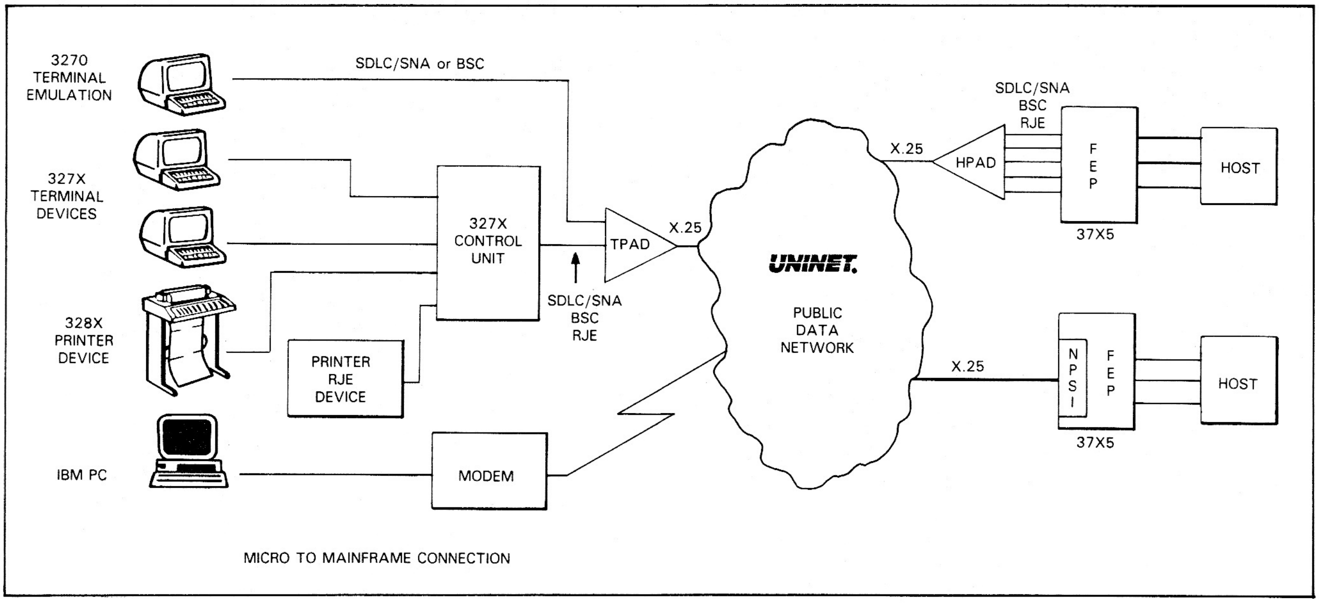
3270
TERMINAL
EMULATION
327X
TERMINAL
DEVICES
328X
PRINTER
DEVICE
IBM PC
SDLC/SNA or BSC
327X
CONTROL
UNIT
PRINTER
RJE
DEVICE
MODEM
SDLC/SNA
BSC
RJE
TPAD
X.25
UNINET
PUBLIC
DATA
NETWORK
X.25
HPAD
SDLC/SNA
BSC
RJE
F
E
P
37X5
HOST
X.25
N
P
S
I
F
E
P
37X5
HOST
MICRO TO MAINFRAME CONNECTION

Figure 5. IBM host connection

▷ Host Connections

US Telecom provides two types of host connections: synchronous and asynchronous. (Pricing for IBM Synchronous Services was not available at the time of this publication. Please contact US Telecom Data Communications Company for appropriate rates.) The synchronous and asynchronous transmission facility pricing includes modems, channel, and full-period maintenance (see Tables 1 and 2). The synchronous (X.25) network connection price ($900 per month with $500 installation charge) includes a synchronous port at a UNINET Interconnect Node (ICN).

Pricing for the asynchronous Host-Packet Assembler/Disassembler (HPAD) for support of an asynchronous host connection, or for the Terminal Packet Assembler/Disassembler (HPAD) is as follows:

	Monthly	Installation
Up to eight ports	$600	$1,000
Up to 16 ports	800	1,000
Each additional 16 ports installed concurrently	800	200

Dial backup for synchronous (X.25) or asynchronous connection is $200 per month.

Customer Terminal Connections

Public Dial-up Access Ports—The hourly charge for access to UNINET via public dial-up access ports (asynchronous 110 to 2400 bps) is based on an hourly charge, and depends on whether high-, medium-, or low-density, or WATS access is used (see Table 3). Nonprime access is also available.

Private Dial-up Access Port—This includes the asynchronous dial-up port at a UNINET TPAD, modem at the port, and full-period maintenance. Monthly rate per port for high density is $300 and for medium density, $500; the installation charge is $500.

Private Leased Access Port—Monthly charges for an asynchronous port at a UNINET TPAD is $225 for high density and $425 for medium density; the installation charge is $500.

Data Transmission

The following network usage rates apply to public dial access ports, private access ports, TPAD facility, and host-to-host access.

Kilocharacters per Month	Charge per Kilocharacter
1- 25,000	$0.05
25,001- 75,000	0.04
75,001-150,000	0.03
150,001-250,000	0.02
Over 250,000	0.01

Nonprime Time Access

With no minimum usage, $0.005.

With $5,000 minimum usage, $0.005 after the first 100 kilocharacters per hour.

Discount Schedules

Volume Discount Plan—Customers whose monthly public dial-up usage exceeds 2,000 hours in any density classification (high, medium, or low) are eligible for the volume ▷

discount plan. Public dial hours already discounted under an ESA arrangement or a nonprime minimum usage agreement cannot be included in calculating volume discounts. The volume discount plan pricing is as follows:

Dial Hours per Month by Density	Discount
2001-4000	25%
4001-5000	30%
Over 5000	40%

Extended Service Agreement (ESA)—The ESA discounts apply only to usage charges (prediscount prime or nonprime time kilocharacter charges; prediscount prime or nonprime domestic public network high-, medium-, and low-density connection charges). No other discounts may be applied to ESA usage. ESA discounts are as follows:

Minimum Payment Commitment	Usage Charge Discount
Minimum $10,000/month	up to 10%
Minimum $20,000/month	up to 15%
Minimum $35,000/month	up to 25%
Minimum $60,000/month	up to 35%

MICROCOMPUTER SOFTWARE/ SERVICES

UNINET, by using the Microcom Networking Protocol (MNP), provides personal computer and terminal users with the ability to communicate with other personal computers, as well as minicomputers and mainframes. This is accomplished in an error-free environment over standard voice grade lines. The MNP protocol gives users the ability to transfer files, provides graphics capabilities, provides entire software programs, and makes the user's equipment part of a network rather than merely a standalone device. MNP is available through public dial access in the following cities.

Atlanta, GA
Boston, MA
Chicago, IL
Dallas, TX
Houston, TX
Kansas, MO
Newport Beach, CA
New York, NY
San Francisco, CA
Washington, DC

OTHER PROFESSIONAL SERVICES

Worldlink is US Telecom Data Communications Company totally integrated electronic messaging service. It offers a state-of-the-art service interface for sending and receiving messages via Telex. By combining US Telecom Data Communications Company's data network and Worldlink, universal connectivity to any destination is available using virtually any terminal, domestic or international Telex, high-speed (telephone) packet, electronic mail, telegram, nightletter, mailgram, postal, or hard copy delivery, day or night. Worldlink compensates for time zone differences.

UNINET's *Lock-out service* is available at the customer's request, for WATS and international lines. The Lock-out service entails the blocking of specified lines; in other words, individuals using those lines may not log-on to UNINET.

Dial Backup is available as an option for synchronous hosts, asynchronous hosts, or TPAD facilities. This service backs up telephone company leased lines. It includes two dial-up lines and a Dial Backup control unit at the user's site.

ON-LINE DATABASES

Access to public on-line databases provided by various information retrieval services is available via the UNINET. To access the public on-line databases provided by these vendors, the user need only to dial the local UNINET telephone number and log-on with the convenient two-step, log-on feature provided by UNINET.

Specific international access procedures and a list of contacts for each country are available from UNINET's on-line information service, *NETINFO.*

FUTURE PLANS

The new company formed by the merger of GTE Sprint and US Telecom, US Sprint Communications Company, plans to provide superior network capabilities. It also expects to be the first company to operate an all-digital nationwide network. □

VU/TEXT Information Services, Inc.

VU/TEXT Information Services, Inc., a Knight-Ridder company, provides on-line access to the full text of more than 40 newspapers, as well as to magazines, newswires, and maritime and business information sources. In addition, through its VU/QUOTE service, VU/TEXT provides 20-minute delayed quotes for NYSE, AMEX, and NASD stock issues; market summaries; and commodities quotes. VU/TEXT's subscribers may also access the 100 databases offered by QL Systems Limited and the 45 databases offered by Profile Information (formerly Datasolve Limited) via gateway arrangements.

VU/TEXT's subscriber base of more than 6,000 is drawn from newspapers, corporations, libraries, law firms, universities, the media, marketing and advertising firms, government agencies, and other institutions.

REPORT HIGHLIGHTS: **PAGE**
Pricing 103
On-line Databases 107

COMPANY INFORMATION

VU/TEXT Information Services, Inc.
325 Chestnut Street
Suite 1300
Philadelphia, PA 19106 (215) 574-4400; (800) 323-2940

Company Background

Founded in 1981 as In/Form, VU/TEXT Information Services, Inc. adopted its present name in 1983. A subsidiary of Knight-Ridder, VU/TEXT provides on-line access to the full text of national and regional newspapers and newswire services, as well as to leading business databases. The size of its service has grown dramatically over the years, from just 4 newspaper databases when it started in 1981, to more than 40 today.

VU/TEXT was born out of a need for reporters and editors to have instant access to newspaper clippings, which they use for background when writing news stories. Originally, VU/TEXT offered access to *The Philadelphia Inquirer* and *Daily News* databases to Philadelphia-area companies, libraries, etc. VU/TEXT has since expanded its offerings to include other metropolitan areas by adding such databases as *The Boston Globe*, *Chicago Tribune*, *Detroit Free Press*, *Washington Post*, and *The Los Angeles Times*. In fact, VU/TEXT has amassed the world's largest newspaper data bank. The company now provides on-line access to the electronic versions of more than 40 newspapers nationwide.

VU/TEXT has added other business-related files to its database menu, such as *ECS Marine Credit Reports*, *Transportation News Ticker (TNT)*, *FISYS Ship Characteristics*, and *The Journal of Commerce*. These databases are sources of maritime information as well, and they are exclusively offered by VU/TEXT. Also available through VU/TEXT are the more than 100 databases offered by the Canadian firm, QL Systems Limited (see Report OL20-764-101, in Volume 1 of this Directory). These databases provide information on a wide variety of subjects, such as the environment, parliament and government, law, news, energy, mining, communications, and the Canadian North. Also available are the more than 45 databases of Profile Information (formerly Datasolve Limited), a leading on-line information service in Britain.

All VU/TEXT newspaper and wire service databases are full text, while *PROMT* and *ABI/INFORM* are in summary and abstract form.

Competitive Position

In September 1988, VU/TEXT's parent company, Knight-Ridder, purchased the on-line industry's leading vendor, DIALOG Information Services. DIALOG offers the industry's most well-rounded selection of files, including most of the major databases in many subject areas. DIALOG and VU/TEXT are working out a gateway arrangement whereby subscribers to one service will be able to access the databases from the other, without undergoing a separate logon procedure. In anticipation of the gateway, in January 1989 VU/TEXT dropped several of its business files that were also available on DIALOG, including *PROMT*, *Disclosure*, and *ABI/INFORM*.

The capability to offer its subscribers easy access to DIALOG's databases (when this happens) should make VU/TEXT even more attractive to prospective subscribers. Already, VU/TEXT is the leading on-line newspaper vendor with a current tally topping 40. (And VU/TEXT plans to add another 15 newspapers to its on-line palette during 1989.) The company reports that 75 percent of its files are unique to its service and available within 24 to 48 hours of publication. It's not surprising that VU/TEXT has seen its subscriber base, now at 6,000, grow steadily.

Forever nipping at VU/TEXT's heels, however, is the aggressive DataTimes, an Oklahoma-based on-line vendor, which also specializes in newspapers. DataTimes offers many of the Gannett papers (VU/TEXT, as a Knight-Ridder company, stresses Knight-Ridder papers). A big coup for DataTimes came when it worked out an arrangement with Dow Jones News/Retrieval to offer a gateway to News/Retrieval's databases. While News/Retrieval does not offer nearly the breadth of databases that DIA-

▻

VU/TEXT Information Services, Inc.

▻ LOG does—for example, in the business world it is highly regarded—it is the only source for the full text of the electronic version of the *Wall Street Journal.*

Despite DataTimes' deal with Dow Jones, the DIALOG connection gives VU/TEXT a definite edge. For now, the market is still large enough to support both companies, but certainly VU/TEXT is making things increasingly uncomfortable for DataTimes.

RESOURCES AND FACILITIES

Processing Center

VU/TEXT's data center is located in Philadelphia. It houses two IBM 4341 mainframe computers plus several AT&T 3B computers.

Systems Software

OPERATING SYSTEM: VU/TEXT uses the DOS/VSE operating system for its IBM computers; its AT&T computers operate in the UNIX environment.

DATA AND DATABASE MANAGEMENT: VU/TEXT uses the QL software for database maintenance, access, and search capabilities. The retrieval system allows users to search any word or combination of words, since virtually every word is indexed by the software. The VU/TEXT data center provides an electronic library capability to nearly 30 newspapers, and it has the capacity to handle time-sharing and private files.

Customer Support Service

VU/TEXT provides numerous customer support services, including a comprehensive User Guide that is available upon request. (Updates to the Users Guide are priced at $15 per year.) New users automatically receive an introductory guide, Ready Reference Guide, miniguide, and free on-line time to aid new users in learning the system. VU/TEXT also offers beginning and advanced training sessions in cities nationwide including Philadelphia; Washington, DC; New York; Chicago; Houston; and Los Angeles, as well as an 800 hot line; and periodic newsletters and updates to subscribers. Additional copies of the VU/TEXT newsletter, as well as Ready Reference Guides, are provided free to subscribers upon request.

Sales and Marketing Services

VU/TEXT is marketed nationwide via trade shows, print advertising, direct mail, telemarketing, and personal sales calls. Newspapers wishing to market their own databases, as well as the entire VU/TEXT service, also represent VU/TEXT regionally. Such offices exist in Akron, Lexington, Sacramento, Charlotte, Richmond, Chicago, Detroit, New York, and Allentown, with the main sales office located in Philadelphia. VU/TEXT is also available to subscribers of West Publishing Company's WESTLAW service.

PROCESSING SERVICES

Pricing

VU/TEXT charges no subscription fee. In the case of most of its databases, customers pay only for connect time plus telecommunications.

Connect time charges vary according to the database accessed (see Table 1, Pages OL20-961-103, -106). Subscribers can opt for a contract rate, which guarantees a minimum of $96 of VU/TEXT usage per month, thereby qualifying them for lower hourly connect charges (unused time is billed at $96 per hour). Or they may subscribe under an open rate, for which they pay only for time used, at a slightly higher rate. Option II subscribers also pay a $15 monthly maintenance fee.

Users

VU/TEXT currently has over 6,000 subscribers. While newspapers account for many of VU/TEXT's users, the distribution also includes law firms; colleges and universities; information managers; librarians; and end users in business, industry, government, and advertising and public relations.

Availability

VU/TEXT is available for access 23.5 hours a day, 7 days a week.

APPLICATION-SPECIFIC SERVICES

VU/TEXT currently provides on-line access to numerous databases, including newspaper files, newswire services, and business publications. Most newspaper databases are updated daily, while other databases are updated weekly or monthly, depending on the database provider.

Electronic Library Service

VU/TEXT provides database management or computerized library services for many of the newspapers available, including *The Wall Street Transcript, The Boston Globe, Chicago Tribune, Lexington Herald-Leader, The Sacramento Bee*, and others. These newspapers store their back issues in VU/TEXT's mainframe computer. The databases are updated by either daily telecommunications or ▻

		Format	Available from	Update Frequency	COST	
					Option I $/min.	Option II $/min.
NEWSPAPERS						
Alaska	Anchorage Daily News	full text	10/85	24-48 hr.	1.60	1.90
Arizona	Arizona Republic	full text	5/86	48-72 hr.	1.60	1.90
	Phoenix Gazette	full text	5/86	24-48 hr.	1.60	1.90
California	Fresno Bee	full text	3/86	24-48 hr.	1.60	1.90
	(Los Angeles) Daily News	full text	10/85	24 hr.	1.60	1.90
	Los Angeles Times	full text	1/85	24 hr.	1.60	1.90
	Sacramento Bee	full text	3/84	24 hr.	1.60	1.90
	San Jose Mercury News	full text	6/85	24 hr.	1.60	1.90
DC	Washington Post	full text	4/83	24 hr.	1.60	1.90
Florida	El Nuevo Herald	full text	11/82	24-48 hr.	1.60	1.90
	Fort Lauderdale News	full text	1/85	48 hr.	1.60	1.90
	Fort Lauderdale Sun-Sentinel	full text	1/85	24-48 hr.	1.60	1.90
	Miami Herald	full text	1/83	24-48 hr.	1.60	1.90
	Miami News	full text	8/83-12/88	(Not applicable)	1.60	1.90
	Orlando Sentinel	full text	4/85	24 hr.	1.60	1.90
	Palm Beach Post	full text	8/88	24-48 hr.	1.60	1.90
Georgia	Atlanta Constitution	full text	1/87	96 hr.	1.60	1.90
	Atlanta Journal	full text	1/87	96 hr.	1.60	1.90
Illinois	Chicago Tribune	full text	1/85	24 hr.	1.60	1.90
Indiana	(Gary) Post-Tribune	full text	11/86	24-48 hr.	1.60	1.90
Kansas	Wichita Eagle-Beacon	full text	10/84	48-72 hr.	1.60	1.90
Kentucky	Lexington Herald-Leader	full text	1/83	24 hr.	1.60	1.90
Maryland	(Annapolis) Capital	full text	6/86	24-48 hr.	1.60	1.90
Massachusetts	Boston Globe	full text	1/80	48-72 hr.	1.60	1.90
Michigan	Detroit Free Press	full text	1/82	24 hr.	1.60	1.90
Missouri	St. Louis Post-Dispatch	full text	1/87	72 hr.	1.60	1.90
New York	(Albany) Times-Union	full text	3/86	48-72 hr.	1.60	1.90
	Knickerbocker News	full text	3/86-4/88	(Not applicable)	1.60	1.90
	Newsday	full text	1/87	24 hr.	1.60	1.90
North Carolina	Charlotte Observer	full text	7/85	24 hr.	1.60	1.90
Ohio	Akron Beacon Journal	full text	1/85	24 hr.	1.60	1.90
	Columbus Dispatch	full text	7/85	24-48 hr.	1.60	1.90
Pennsylvania	(Allentown) Morning Call	full text	1/84	48-72 hr.	1.60	1.90
	Philadelphia Daily News	full text	1/78	48 hr.	1.60	1.90
	Philadelphia Inquirer	full text	1/81	24 hr.	1.60	1.90
South Carolinia	(Columbia) State	full text	12/87	24 hr.	1.60	1.90
Texas	Houston Post	full text	1/85	24 hr.	1.60	1.90
Virginia	Richmond News Leader	full text	8/85	24 hr.	1.60	1.90
	Richmond Times-Dispatch	full text	8/85	24 hr.	1.60	1.90
Washington	Seattle Post-Intelligencer	full text	6/86	24 hr.	1.60	1.90

Table 1. VU/TEXT Information Services' database pricing schedule (as of November 1988)

by magnetic tape as often as needed. VU/TEXT provides the design, programming, communications expertise, database management, updating, and support for these publications at a fraction of the cost of establishing an independent electronic library system. The database can be private or marketed as part of VU/TEXT, whichever the publisher chooses.

Investor Services

VU/TEXT offers realtime, investor-oriented services based on a database called VU/QUOTE, which provides 20-minute delayed stock quotes and other information from the New York and American Stock Exchanges, as well as commodity quotes. The *Knight-Ridder Financial News* database offers news and analysis on financial and commodity markets.

NETWORK SERVICES

VU/TEXT's databases are accessible via the Telenet and Tymnet packet-switching networks at 300, 1200, and 2400 bps. The same connect time charges apply to 300 and 1200 rates; 2400 bps access is billed at a 50 percent surcharge. Any ASCII terminal, microcomputer, or word processor with a full-duplex modem can be used to access

				COST	
	Format	Available from	Update Frequency	Option I $/min.	Option II $/min.
NEWS AND CURRENT EVENTS					
Associated Press National, international, business, and sports news	full text	1/85	24 hr.	1.60	1.90
AP Political File Information on candidates and campaigns	full text	1980	24 hr.	1.60	1.90
KNT News Wire Selected news stories from Knight-Ridder newspapers, Tribune Company newspapers The Boston Globe, and The Dallas Morning News	full text	1/87	24 hr.	1.60	1.90
LIFE News background and analyses of people, events, and trends	full text	8/86	monthly	1.60	1.90
People Focuses on noted personalities in television, movies, the theatre, sports, etc.	full text	8/86	weekly	1.60	1.90
Sports Illustrated Coverage of professional, collegiate, and amateur athletes and teams,	full text	7/86	weekly	1.60	1.90
TIME Information on international and national events, politics, business personalities, sports, science, the arts, and current trends	full text	1/85	weekly	1.60	1.90
BUSINESS AND FINANCE					
Business Dateline Business activities and trends from more than 150 regional publications in the U.S. and Canada	full text	1/85	weekly	1.60	1.90
Business Wire Press releases issued by more than 9,000 corporations and organizations, including many OTC companies	full text	1/88	24 hr.	1.60	1.90
FORTUNE In-depth coverage of business trends and developments	full text	1/85	biweekly	1.60	1.90
Journal of Commerce Transportation, international trade, and business news; includes information on ocean, barge, rail, air, and truck transportation; international banking and finance; foreign trade; energy; insurance; commodities; chemicals and plastics	full text	8/18/86	72 hr.	1.60	1.90
Knight-Ridder Financial News Financial market information involving banking, economic issues, commodities, credit markets, the Federal Reserve, foreign exchange and indexes, energy, and textiles	full text	1/87	24 hr.	1.60	1.90
Money Information on consumer finance including investments, taxes, real estate, insurance and education	full text	8/88	monthly	1.60	1.90

Table 1. VU/TEXT Information Services' database pricing schedule (as of November 1988). (Continued)

VU/TEXT Information Services, Inc.

				COST	
	Format	Available from	Update Frequency	Option I $/min.	Option II $/min.
PR Newswire Press releases from more than 12,000 companies, government agencies, and other news sources nationally; includes corporate developments, industry trends, and news from smaller companies not covered by the media; also selected mediawire releases	full text	1/85	24 hr.	1.25	1.50
VU/QUOTE Stock (NYSE, AMEX & NASD) and commodity quotes, market summaries	tables	20 minute delay	continuously throughout the trading day	0.83	1.00
WARNDEX (Wall Street Transcript) Exclusive company and industry information; verbatim transcripts of roundtable discussions between corporate officers and industry analysts; brokers reports; also contains CEO interviews and money manager previews	full text	7/81	weekly	4.17	4.92
MARITIME INFORMATION					
ECS Marine Credit Reports In-depth reports on thousands of international shipping companies including financial and managerial information, fleet details, credit evaluations, and current market experience	full text	most current	weekly	$150/V-report (full) $120/R-report (spot)	
FISYS Ship Characteristics Up-to-date information on more than 27,000 ships on order or delivered since 1967	full text	most current	weekly	1.60	1.90
Transportation News Ticker (TNT) Shipping news, including ship charters, cargo offerings, official requirements, fixtures, weather, port conditions, marine casualties, bunker fuel prices, and maritime legislation	full text	5/85	24 hr.	1.67	1.90
OTHER DATABASES					
Academic American Encyclopedia Grolier's full 20-volume encyclopedia, with more than 32,000 articles	full text	current edition	quarterly	0.83	1.00
Recipe Database Recipes published in the *Detroit Free Press*	full text	9/83	24 hr.	1.60	1.90
Training Databases Three weeks of articles from six newspapers	full text	April 17-May 7, 1988	not applicable	0.08	0.08
QL SEARCH* In addition to Canadian news sources (including the full text of the Canadian Press wire and Business Information wire), QL Search offers more than 80 Canadian databases covering subjects, such as environment, parliament and government, law, news, energy, asbestos, pollution, business, mining, communications, and the Canadian North	varies by database from full text to abstracts and titles	varies	varies	1.90 plus surcharges on databases	1.90

Table 1. VU/TEXT Information Services' database pricing schedule (as of November 1988). (Continued)

VU/TEXT Information Services, Inc.

				COST	
	Format	Available from	Update Frequency	Option I $/min.	Option II $/min.
PROFILE INFORMATION DATABASES* (formerly Datasolve)					
Asahi News Service	full text (selected stories)	8/82	24 hr.	2.40	2.40
BBC Summary of World Broadcasts	full text	1/82	48 hr.	2.40	2.40
Business Week	full text	1/85	weekly	2.40	2.40
Campaign	full text	9/85	weekly	2.40	2.40
Celex	full text	most current	monthly	2.40	2.40
Consumer Magazine Index	report summaries	1/86	monthly	2.40	2.40
Consumer Press Index	abstracts	4/86	monthly	2.40	2.40
Daily/Sunday Telegraph	full text	3/87	72 hr.	2.40	2.40
The Economist	full text	12/81	weekly	2.40	2.40
Euromonitor	full text	most current	every 6 months	**2.40	**2.40
The Financial Times	full text	1/85	48 hr.	2.40	2.40
Financial Times Business Reports					
—Business/Finance file	full text	9/86	weekly	2.40	2.40
—Energy file	full text	1/87	weekly	2.40	2.40
—Media file	full text	1/86	weekly	2.40	2.40
—Technology file	full text	1/86	weekly	2.40	2.40
The Guardian	full text	7/84	daily, 5 days after publication	2.40	2.40
Jordans Company Reports	full text	most current	weekly	**2.40	**2.40
Keesing's Record of World Events	full text	1/83	monthly	2.40	2.40
Market Research Reports	full text	2/87	variable monthly	2.40	2.40
Marketing	full text	9/85	weekly	2.40	2.40
Marketing Surveys Index	full text	1/83	monthly	2.40	2.40
McCarthy Online Company Fact Sheets	full text and tables	most current annual reports	as available	2.40	2.40
McCarthy Online Press Cuttings Service	full text or referenced articles	10/85	72 hr.	2.40	2.40
Media Week	full text	7/86	weekly	2.40	2.40
Metra National Development Plans	full text	most current	twice yearly	2.40	2.40
Mintel Daily Digest	article summaries	9/86	24 hr.	2.40	2.40
New Scientist	full text	5/85	weekly	2.40	2.40
PR Week	full text	8/85	weekly	2.40	2.40
Spearhead	full text	most current	monthly	2.40	2.40
Super Marketing	full text	4/87	weekly	2.40	2.40
TASS	full text	11/85	24 hr.	2.40	2.40
Tenders Electronic Daily	full text	last 6 months	same day	2.40	2.40
The Times of London/Sunday Times	full text	7/85	48-72 hr.	2.40	2.40
Today	full text	3/86	varies	2.40	2.40
World Bank IBOS	full text	6/86	monthly	2.40	2.40

**Requires separate password (free)—indicate request on VU/TEXT SUBSCRIBER AGREEMENT, or write Subscriber Services.*
***Plus $0.10 per line*

TELECOMMUNICATIONS

VU/TEXT via Telenet, Tymnet, and WESTLAW Gateway	$0.167 per minute ($10/hr.)
PROFILE via Telenet	0.60 per minute ($36/hr.)

PRICING

SIGN-UP FEE

There is a onetime sign-up fee of $50 to become a VU/TEXT subscriber. This fee entitles you to a User Guide and free updates, a password, one month of unlimited access to the training databases, a free subscription to the VU/TEXT newsletter, *Newsline*, and a toll-free Customer Service Hotline.

RATES

OPTION I: CONTRACT RATE—Offers a lower rate for the subscriber who guarantees a $96 per month minimum fee. This fee is applied toward usage.

OPTION II: OPEN RATE—Requires no monthly minimum usage. The subscriber pays for the time the system is used plus a $15 monthly maintenance fee.

Table 1. VU/TEXT Information Services' database pricing schedule (as of November 1988). (Continued)

VU/TEXT Information Services, Inc.

Pricing applies to 300 and 1200 baud rates. **NO PREMIUM IS ADDED FOR 1200 BAUD TRANSMISSION.** 2400 baud access is billed at 50% above 1200 baud connect hour rates.

Volume discounts are available on most of the databases and are based on connect time of five hours or more (per month). Prepaid contracts for ECS marine also earn discounts. Schedules are available upon request.

TRAINING

VU/TEXT offers training throughout the country. Introductory sessions are $50 and the Intermediate; review sessions are $35.

USER GUIDE

Subscribers will receive an introductory guide, ready reference guide, and miniguide with password. A User Guide with updates is available for a $15 annual fee.

OFF-LINE PRINTS

Off-line prints are 60¢ per page (two screens), except for off-line prints from *The Wall Street Transcript*, which are ($1.75) per page.

WESTLAW

WESTLAW subscribers receive a VU/TEXT password as part of the WESTLAW service. Option II prices without the monthly maintenance fee apply to WESTLAW subscribers, unless they notify VU/TEXT to request Option I. WESTLAW subscribers should contact VU/TEXT to order the User Guide.

CANADIAN ACCESS

Canadians can access VU/TEXT through QL Systems Ltd. in Canada.

Table 1. VU/TEXT Information Services' database pricing schedule (as of November 1988). (Continued)

VU/TEXT. An 80-character display is preferable, although VU/TEXT will display on narrower screens. To access the system, the user simply dials up the local Telenet or Tymnet telephone number through his or her workstation, signs on, names the database to be searched, and designates the search terms.

VU/TEXT is currently accessible throughout the continental United States, as well as Hawaii, Canada, Australia, and Europe.

ON-LINE DATABASES

VU/TEXT offers newspapers, newswire services, and business databases. All of this information is in full-text form.

In addition to its own databases, VU/TEXT's subscribers can access the more than 100 databases offered by QL Systems Limited. These databases cover subjects such as the environment, parliament and government, law, news, energy, asbestos, pollution, business, mining, communications, and the Canadian North. Formats vary by database, from full text to abstracts to titles. (See Report OL20-764-101 for more information on QL Systems Limited.) Also available are the more than 45 databases of Profile Information, a leading on-line information service in Britain. Profile offers three products: *World Reporter*, *World Exporter*, and *MAGIC*. World Reporter is the U.K.'s largest full-text international news and current affairs service and includes databases such as *TASS*, *Financial Times*, *Guardian*, and *The Economist*. World Exporter is a complete on-line information service for people involved in export planning, marketing, and finance. MAGIC is specifically designed for professionals in the marketing and advertising industries, with primary focus on the U.K. and good coverage available for leading European/U.S. markets.

The following features apply to all VU/TEXT databases:

- Virtually every word is indexed and features a free search capability.
- Proximity connectors allow combinations of terms within "x" (up to 255) words or within the same paragraph.
- Terms can be combined using Boolean connectors "and", "or", and "not".
- Field searching allows users to narrow a search to meet their needs (e.g., only stories with a certain byline).
- Field displaying allows users to only display or print that part of the article they need.
- Date and date-range searching allows a user to narrow a search to a specific time period.
- The "Window" function allows users to scan shortened versions of articles, with the ability to open up to full text whenever necessary.
- Searches can be saved and combined.
- On-line or off-line printing capability is available.
- Search terms may be truncated for variations of roots.
- A dictionary of all searchable words in the database is on-line.
- Keywords have been added to most newspaper databases to provide alternate ways of searching.
- Search results can be ranked in standard or reverse chronological order or by most frequent occurrence of search terms.
- Searches can be carried forward across databases without rekeying.

VU/TEXT Information Services, Inc.

- Searches can be run against groups of databases, such as all newspapers and wires, or business journals and newspapers in mid-Atlantic states, etc.

Brief descriptions of VU/TEXT's databases follow; many of these databases are described in more detail in the OL40 section of this Directory. Also, the price list beginning on Page OL20-961-103 describes VU/TEXT's business and finance and Maritime Information files.

Academic American Encyclopedia—a full-text encyclopedia with articles covering topics from A to Z; updated quarterly.

Akron Beacon Journal—detailed full-text coverage of one of the nation's most heavily industrialized regions—the "rubber capital of the world"—as well as national and international news.

(Albany) Times-Union/Albany Knickerbocker News—The Times Union is a morning paper published Monday through Saturday, and *The Knickerbocker News* is an afternoon paper published daily. The papers (which are from New York's capital) concentrate heavily on monitoring the state government and legislation. Special emphasis is also placed on local politics, sports, business, industry, entertainment, and life-styles.

The (Allentown) Morning Call—the full text of news items, feature stories, and editorials, with in-depth coverage of Pennsylvania state and metro-Allentown area news on topics such as local industry, business and economy, sports, and the arts.

The (Annapolis) Capital—located in Maryland's capital, this newspaper database covers state and local government, the U.S. Naval Academy, tourism, the maritime and seafood industries, and the environment.

Anchorage Daily News—full text of reports on Alaska's natural resources: oil, gold, platinum, timber, and natural gas. It also covers international affairs and native issues including Alaska's government and business.

AP Political File—dates back to January 1980 and provides up-to-date, full-text campaign stories, biographies of candidates, and summaries of the races and candidates for all 50 states. AP Political File is prepared by the Associated Press' state and national political writers, as well as by its 137 bureaus.

The Arizona Republic—a general circulation paper, as well as the largest paper in the state. The *Republic* is published every morning including Sunday. It covers the entire state and Mexico. Information on the high tech, aviation and aerospace, and tourism industries is available in full text.

Associated Press—full text of the national, international, business, and sports news from AP's high-speed Datastream service. The database provides general-interest news to the media worldwide with 135 news bureaus in the U.S. and 83 bureaus in foreign countries. AP stories are available 24 hours after transmission.

The Atlanta Constitution—One of the Southeast's top dailies, this paper is strong in sports coverage and reports in key areas such as business, finance, transportation, industry, and trade. Coverage is from January 1988 to the present.

The Atlanta Journal—A top source for business news in an area that features the headquarters of such national corporations as Coca-Cola, RJ Reynolds, Nabisco, BellSouth, Georgia Pacific, and Delta and Eastern Airlines. Coverage is from January 1988 to the present.

The Boston Globe—extensive business coverage of New England, as well as national, political, and technological information. Full text of the newspaper from January 1980 forward is available now.

Business Dateline—contains the full text of selected articles from more than 140 regional business publications in the U.S. and Canada, dating back to January 1985. Local topics are covered including company profiles, real estate markets, market strategy and analysis, executive summaries, economic conditions, financial and industrial management, industry regulation, and new product development.

The Charlotte Observer—full-text information from one of the nation's most active business, financial, and transportation centers. The file covers developments concerning the nation's textile industry, moves by banks that are among the most aggressive in the U.S., and transportation events centered around the Southeast's third largest airport.

Chicago Tribune—the full text of articles from January 1985 forward. The database provides information on the Midwest including business, commodities trading, agriculture, science, and sports, as well as national and foreign news. Articles are available 24 hours after publication.

Columbia State—a daily morning paper, the largest in South Carolina, providing local, national, and international coverage. The newspaper emphasizes South Carolina government and politics and business. It also provides extensive coverage of textiles, tourism, agribusiness, and banking.

The Columbus Dispatch—in-depth, full-text coverage of the following: state government, banking, insurance, research information, and business franchises.

Detroit Free Press—the full text of all stories, features, columns, and editorials in the *Free Press* from March 1982 forward. Coverage includes the nation's auto industry and labor issues, daily regional business news, and national and international news.

VU/TEXT Information Services, Inc.

ECS Marine Reports—a leading international source of credit analyses of shipping companies. ECS Marine provides reports covering a company's financial status, management structure, size of fleet, areas of activity, and credit evaluation.

El Nuevo Herald—a daily Spanish-language newspaper published by the *Miami Herald* and distributed by the Hispanic community of southern Florida. Extensive coverage of Latin American politics and commerce is provided in full text.

Fort Lauderdale News and Sun-Sentinel—comprehensive full-text information on agriculture, business, medicine, tourism, sports and recreation, and retirement.

The Fresno Bee—full text of the general circulation daily newspaper that serves the San Joaquin Valley. *The Bee* concentrates heavily on agribusiness and environmental news, as well as on national, international, and state news.

Fortune—this business magazine focuses on ideas, issues, trends, individuals, and investments that can help companies and their managements make better decisions. The database is updated within one to two weeks of its cover date and contains the full text of all the stories that appeared in the magazine.

(Gary) Post-Tribune—provides regional coverage of northwest Indiana. Full-text news on the steel industry, labor, agribusiness, local colleges, and Indiana politics and government is available.

The Houston Post—extensive coverage of the energy industry, space program (NASA), health-related issues (Texas Medical Center), and international business and trade (Port of Houston). In addition, local coverage includes politics and government, business and economy, entertainment and life-styles, and sports in full text.

The Journal of Commerce—provids transportation, international trade, and business news and includes full-text information on ocean, barge, rail, air, and truck transportation, as well as on international banking and finance, foreign trade, energy, insurance, commodities, chemicals, and plastics.

Knight-Ridder Financial News—provides full-text news and analysis on financial and commodity markets and the events that move them.

KNT News Wire—selected stories from Knight-Ridder newspapers, Tribune Company newspapers, the *Boston Globe*, and the *Dallas Morning News*.

Lexington Herald-Leader—the full text of the *Lexington Herald-Leader*, with the exception of stock market and television listings and certain sports statistics. Subjects covered are local Lexington news, Kentucky state government news, the coal industry, thoroughbred horse racing and breeding, and collegiate sports.

Los Angeles Daily News—the leading source of regional information about Los Angeles and one of the fastest-growing of California's 119 dailies. The *Daily News* covers national and international news and offers comprehensive coverage of tourism, business, high technology, agriculture, and the citrus industry in full text.

Los Angeles Times—one of the nation's top three national newspapers, the *Times* provides full-text comprehensive coverage of California and in-depth coverage of world and national news.

The Miami Herald—the full text of every article published in *The Miami Herald* since January 1983. Subjects covered include business, government, banking, law, industry, and transportation in southern Florida. *The Herald* also provides comprehensive international coverage with a special focus on Latin American politics and commerce.

Miami News—provides local coverage of Dade County, including the city of Miami. It features county-wide coverage of information on business, government, banking, law, industry, trade, and transportation.

Newsday—the evening newspaper in the U.S. with the largest circulation, this paper is considered the dominant form of mass communications in Long Island. *Newsday* is especially strong in the areas of politics, the retail sales industry, and aerospace and high technology news.

The Orlando Sentinel—the full text of all stories, features, columns, editorials, letters-to-the-editor, and articles by the newspaper's special correspondents. Special attention is given to tourism, business, high technology, agriculture, and the citrus industry.

The Palm Beach Post—a major metropolitan newspaper circulating in seven South Florida counties. Strong areas of coverage include residential real estate, financial and banking news, and regional business news spotlighting such businesses as Pratt & Whitney Aircraft, Motorola, and utilities such as Southern Bell and Florida Light & Power.

Philadelphia Daily News—the full text of news items and feature stories from the *Philadelphia Daily News*, which is rated second in the country for sports coverage. The *Daily News* provides strong local and some national coverage. Local news includes politics, industry, crime, education, banking, and transportation.

The Philadelphia Inquirer—the full text of news items, feature stories, and editorials, including local, national, and international coverage. Topics covered include government, legal services, banking, industry, education, health care, and shipping.

The Phoenix Gazette—a daily newspaper, published every afternoon. The *Gazette* serves the metropolitan area sur-

▷ rounding Phoenix with both local and national news. The high tech, aviation and aerospace, and tourism industries are covered in full text.

PR Newswire—the full text of PR Newswire, the national wire service that carries press releases from over 8,000 companies and other organizations to the leading domestic and foreign wire services, and to 350 newspapers in 50 cities around the country.

Recipe Database—a supplement to the *Detroit Free Press* database containing all the recipes published by this newspaper.

The Richmond News Leader/Richmond Times-Dispatch—the full text of the *Richmond News Leader*, an afternoon paper published Monday through Saturday, and the *Richmond Times-Dispatch*, a morning paper published daily. The papers provide coverage of city, regional, business, sports, and state government news. They emphasize business, agriculture, and the tobacco industry.

The Sacramento Bee—daily coverage of events in California's state capitol, from March 1, 1984 onward. *The Bee* provides information on Sacramento's inland port, on the area's newest high technology companies, on the area's agriculture, as well as on developments in the entire northeastern part of California in full text.

St. Louis Post-Dispatch—Missouri's largest paper, the *Post-Dispatch* is located in a diversified economic climate. It covers the financial service, beverage, chemical, aerospace, defense, and automotive industries.

San Jose Mercury News—the full text of local, national, and international news. Bureaus in Sacramento and Washington, DC enable the newspaper to provide full coverage of state and federal news. High technology, business, real estate, and science and medicine are emphasized.

Seattle-Post Intelligencer—a Hearst newspaper providing coverage of the Pacific Northwest, especially the Peugot Sound region. The newspaper offers in-depth coverage of the maritime industry, aviation, timber, nuclear energy and nuclear waste, and the environment.

TIME—the full text of articles from one of the most widely read news magazines. Information on international and national events, politics, business, personalities, sports, science, the arts, and current trends.

Transportation News Ticker (TNT)—TNT contains full-text shipping news including ship charters, cargo offerings, official requirements, fixtures, weather, port conditions, marine casualties, bunker fuel prices, and maritime legislation.

VU/QUOTE—a 20-minute-delayed stock quoting service, providing quotes on the stock of all companies listed on the New York and American Stock Exchanges, as well as market summaries that list the 10 most active stocks, the 10 biggest gainers, the 10 biggest losers, block trades, advances/declines, and up volume/down volume during the most recent trading period; 10-minute-delayed commodity quotes are also available.

The Wall Street Transcript—the full text of *The Wall Street Transcript*, a weekly publication covering verbatim reports of roundtable discussions by security analysts on various industries, interviews with corporate officers on product and service plans and announcements, verbatim speeches by chief executive officers to security analyst groups, and brokerage research reports and recommendations. The database also contains Corporate Critics Confidential and CEO Interviews.

The Washington Post—the full text of all staff-written news stories, features, columns, and editorials. The *Washington Post* provides extensive coverage on the national and international scenes. Articles focus on national defense, business and personal taxation, environmental protection, economic policy, law, government regulation, international trade and diplomacy, and politics. The database is updated daily (yesterday's *Washington Post* is available today).

The Wichita Eagle-Beacon—a general circulation newspaper providing in-depth coverage of Kansas State, the Great Plains, and the Big Eight Conference including such topics as local industry, business and economy, agriculture, sports, and the arts. Information is updated twice weekly and is in full text.

OTHER SERVICES

The VU/TEXT data center provides an electronic library capability to a number of newspapers and has the capacity to handle time-sharing and private files. Its current storage capacity exceeds 80 gigabytes.

FUTURE PLANS

VU/TEXT plans to continue adding new newspaper files to its repertoire, with 15 new additions planned for 1989 alone. VU/TEXT also plans to offer its customers access to the databases vended by DIALOG Information Services, now also a Knight-Ridder company. ☐

The WEFA Group

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Synopsis

Editor's Note

This update for The WEFA Group shows a decrease in the number of its on-line databases. The WEFA Group continues to provide planning professionals in industry and government with econometric analysis, forecasting, and consulting services that include a full range of computer-readable databases, software capabilities, and simulation models.

Report Highlights

The largest decline in the availability of databases appears in WEFA's section entitled **International Historical Profiles**. Six databases have been deleted since our last update. They include *Australia*—macroeconomic data coverage for the whole of Australia; *IMF Government Finance Statistics*—a breakdown of government finance data for 125 IMF member countries; *Monthly Current Economic Indicators*—key historical indicators for 31 countries; *Monthly Far East*—covers Australia, Hong Kong, India, Indonesia, Japan, Republic of Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand; and *Monthly Latin America*—key historical indicators for 10 Latin American countries. One database in this area has a new name since our last update but continues to cover the same information. *Nomura Research Institute (NRI/e) Database (Japan)* is now *Japan (NRI & NCC Co., Ltd.—NRI/e)*. Subscribers with questions should contact their WEFA representative. In the **Industry Historical Profiles** area, two databases have new titles: *Bank Holding Companies (Y-9)* is now *BANKROLL II*, and *Branch Deposit* is now *THRIFTROLL*. In the **Forecast Profiles** area, four databases have been deleted: *Canadian Cost Planning Forecast*, *Canadian Provincial Economic Forecast*, *Ferroalloys and Strategic Metals Forecast*, and *World Steel Forecast*.

Vendor

The WEFA Group
150 Monument Road
Bala Cynwyd, PA 19004 (215) 667-6000

Analysis

The WEFA Group offers a wide selection of on-line economic, financial, and demographic information services. In particular, the company offers both forecast and historical databases, with coverage spanning the current century. Statistics range in scope from general macroeconomic indicators to company-specific details. The WEFA Group serves more than 3,000 clients in 40 countries.

Company Background

The WEFA Group resulted from the merger in 1987 of Wharton Econometric Forecasting Associates, Inc. (WEFA) and Chase Econometrics, the independent forecasting subsidiary of Chase Manhattan Bank. The merger combined WEFA's macroeconomic and technological leadership with Chase Econometrics' wealth of data and industry-specific expertise.

Today, The WEFA Group provides planning professionals in industry and government with econometric analysis, forecasting, and consulting services using a full range of computer-readable databases, software capabilities, and simulation models. The forecasting services focus on nine major areas: agriculture, energy, industrial economics, metals and minerals, international economics, U.S. economics, automotive, regional economics, and finance.

The senior staff at The WEFA Group directs separate research, analysis, and data processing staffs, using advanced econometric modeling techniques in preparing short- and long-term forecasts.

As part of its services, The WEFA Group maintains many historical and forecast databases, which it obtains through internal data-collection activities or from other organizations. The database and econometric models are made accessible via timesharing, on disk for access by personal computers, and on magnetic tape.

Subscribers receive regular forecast reports, including analysis of current economic, financial, and political developments, and historical tables.

Competitive Position

The WEFA Group's primary competitor is Data Resources Inc. (DRI). The company also competes with Evans Economics, Inc. and other, smaller forecasting agencies including departments within universities that offer forecasting services. The WEFA Group, which represents the combination of Wharton Econometrics and Chase Econometrics, is a more formidable competitor than either company was individually. The new company takes advantage of Chase's industry group service *and* Wharton's strong world service.

The WEFA Group is also a leader in the development of integrated micro/mainframe software. In addition, it is creating special (off the shelf) studies for sale to clients and nonclients alike.

Resources and Facilities

Processing Centers

The WEFA Group maintains offices in 12 locations throughout North America and Europe, with affiliates in the Far East. In the United States, the WEFA Group has offices in the following cities:

- Chicago, Illinois
- New York, New York
- Bala Cynwyd, Pennsylvania
- San Francisco, California
- Washington, DC

Outside the U.S., The WEFA Group maintains offices in:

- Toronto, Canada
- Brussels, Belgium
- Frankfurt, West Germany
- London, England
- Paris, France
- Milan, Italy
- Rome, Italy

In addition, a worldwide network of professionals, including database managers, provide on-site client-support services. The company also maintains a toll-free hot line and publishes *Trends*, a quarterly newsletter providing clients with updated information on The WEFA Group's products and services.

Pricing

The WEFA Group's pricing for its on-line services is based on some combination of the following variables:

- The cost of accessing the particular database
- The connect hour charge
- The cost in System Resource Units

For additional information, please contact The WEFA Group directly.

Microcomputer Software/Services

AREMOS

AREMOS is an integrated micro/mainframe decision-support system designed specifically for economists, analysts, and planners. With its single, integrated command language, users can:

- Manage and analyze economic or financial data
- Specify and estimate equations
- Build econometric models
- Run simulations of alternative scenarios
- Retrieve data and generate reports
- Produce graphics for analysis and presentations

The WEFA Group has implemented AREMOS in two basic versions: AREMOS/PC and AREMOS/VM. AREMOS/PC runs on IBM PC/XT/AT or compatible computers with 512K bytes or more of main memory, an 8087 math chip, and the PC-DOS operating system. AREMOS/VM runs on mainframe computers under the VM/CMS operating system or under VM/PC on the PC/XT/AT microcomputers.

The two versions of AREMOS are identical in their command syntax and in their wording of prompts and responses. Users can run AREMOS on a microcomputer in an off-line mode without incurring any timesharing costs.

Whenever users want to download data from The WEFA Group's databases, or use a microcomputer as a window to The WEFA Group's resources, they can employ the on-line option temporarily, access the mainframe or international network, and then resume work in the off-line mode. This can be done with a single set of commands.

With AREMOS/PC, users can generate reports off-line that include statistical analyses, actual-versus-predicted values, and cross-tabulations of data series at one or more time points. AREMOS' built-in report writer enables users to format reports with titles, headings, and footnotes. Users can print reports off-line at a printer linked to their microcomputers. AREMOS/VM will generate graphics. With AREMOS/PC, users can get virtually the same graphics capabilities as on the mainframe.

AREMOS/VM, the host-computer version, adds the power of a user's in-house mainframe for supporting workstation analysis and integrating with The WEFA Group's resources.

AREMOS is a key to these computer resources. Users learn only one command language to use the system off-line at workstations or on-line from microcomputers or 3270-type terminals. Users can also work independently of the available computer. For example, users can begin their analyses at their offices on-line with AREMOS/VM, finish them at home with AREMOS/PC, and present them in a different city the next day. If users should have a problem with their in-house computers, they can always switch to The WEFA Group's system.

Mark 9 and AREMOS/PC

Mark 9, The WEFA Group's U.S. Quarterly Model based in AREMOS, can easily be simulated on the IBM PC/AT and its compatibles. This unique model-and-software combination gives clients the power of a large-scale macro model—with complete long- and short-run forecasting capabilities on the PC.

The model is the core of a completely integrated forecasting system featuring:

- A large-scale model of the U.S. economy with full sectoral detail
- Monthly forecast updates, including alternative scenarios
- Model revisions as they occur
- A historical data package
- A comprehensive documentation set

- A full range of simulation and data display capabilities

The WEFA Group's Quarterly Model of the U.S. economy reflects over 20 years of model development and forecasting experience. The core model, recently updated, consists of more than 600 equations. A satellite model provides additional industry detail, including 150 indexes of industrial production. Clients receive sectoral data on:

- Consumer spending
- Business investment
- Employment
- Imports and exports
- Inflation
- Financial market activity
- Fiscal policy
- Industrial production

Because the model is based in AREMOS, it is possible for users to:

- Construct product-line models that integrate client data with that of The WEFA Group
- Maintain databases of macro and proprietary data—without the costs of timesharing and storage
- Run The WEFA Group's other economic models, such as those for individual states and countries

The U.S. Quarterly Model runs optimally on the IBM PC/AT (with 640K-byte memory) and its compatibles. A math co-processor chip is required.

PCDATA2

PCDATA2 is a micro-based software package that allows users to download data from The WEFA Group's databases to their personal computers. By providing a direct link to the mainframe, data is retrieved quickly and efficiently. PCDATA2 is completely menu driven with pop-up windows that display the available options. No prior knowledge of The WEFA Group's system is needed.

Data is automatically converted into a variety of widely used file formats. Data requests are set up on the personal computer (not on the mainframe), minimizing the timesharing costs.

Forecasting Services

The WEFA Group provides planning professionals in industry and government with econometric analysis, forecasting, and consulting services using a full range of computer-readable databases, software capabilities, and simulation models.

The forecasting services focus on nine major areas reflecting the organization of world economic activity:

Food and Agriculture	international, national, regional, and statewide agricultural activity
Energy	political and economic analysis of major sources of energy
Industrial Economics	production, sales by market, final demand by type, employment, and investment of 480 industries
Metals and Minerals	worldwide metals and minerals markets
International Economics	economic and political analysis for the individual economies of Western Europe, Latin America, the Far East, Africa, the Middle East, and North America
U.S. Economics	analysis of all major sectors of the U.S. economy
Automotive	emphasis on opportunities, risks, and strategic alternatives for automotive products, components, and aftermarket activity
Regional Economics	employment, population, income, financial, industrial, consumer expenditures, and energy price and demand variables for each of the 50 states and metropolitan areas
Financial	analysis of financial activity at the national, regional, and international levels

Scope and/or Subject Matter

Industrial, financial, and aggregate national, regional, and international economics in the areas of agriculture; capital expenditures; construction and housing; consumer expenditures; cyclical indicators; employment, wages, and salaries; exchange rates; finance; government finance; industrial production; interest rates; labor force; manufacturers' shipments, inventories, and orders; personal income; population; price indexes; retail sales; selected national income accounts; supply and demand; and transportation.

Data Sources

Data is collected primarily from government agencies and central banks, supplemented by private sources where appropriate. Also used are foreign government international agency reports, including those of the International Monetary Fund (IMF), the United Nations, and the Organization for Economic Cooperation and Development (OECD).

Publications

- All services issue regular reports containing short- and long-term analyses and forecasts.
- A *Database Documentation Catalog* lists databases with disk name, catalog number, and price.
- *Trends*, issued quarterly, covers the latest developments in The WEFA Group's products and services.

Networking Services

Clients can access The WEFA Group's system through Interactive Data Corporation's network or via the Tymnet, Telenet, or Datapac telecommunications networks.

On-line Databases

The WEFA Group provides computerized services such as data management, general data analysis, econometric analysis, modeling and simulation, reports, graphs, and customized applications. Offering more than 100 databases on-line and in other formats, The WEFA Group supplies several access options. The databases are available on-line as well as on disk for access via personal computers and on magnetic tape for mainframe and minicomputer access.

In addition to accessing the databases for purposes of analysis, clients can also simulate The WEFA Group's models to generate alternative forecasts based on their own assumptions.

The full range of databases available includes the following:

U.S. Macroeconomic Historical Profiles

Annual Survey of Manufacturers	historical data from the Census of Manufacturers and the Annual Survey of Manufacturers, covering intercensal years; available out to the four-digit SIC level.
Business Conditions Digest	economic activity, business indicators, and diffusion indexes for the U.S. economy.
Conference Board	consists of economic data monitored by the Conference Board, including its economic forecasts and consumer and business survey results.
Consumer Price Index	detailed monthly historical consumer price indexes for the total U.S., 28 urban metropolitan areas, and population-size class regions.
Financial	key financial indicators for the U.S. market from the Federal Reserve Board and other sources.
Flow of Funds	traces the effect of the nonfinancial economy on the financial markets.
Household Age/Income	detailed annual historical data on age/income interaction by demographic category.
National Income and Product Accounts (NIPA)	complete historical data for the NIPA for the U.S., as compiled by the Bureau of Economic Analysis.
Producer Price Index by Commodity	monthly historical price indexes by commodity as provided by the Bureau of Labor Statistics for nearly 3,200 commodities and by stage of processing.
Producer Price Index by Industry	historical producer price indices provided by the Bureau of Labor Statistics for four-digit SIC codes and their related Census of Manufacturers' product extension codes.
U.S. Macroeconomic	historical coverage of all aspects of the U.S. economy.

U.S. Regional Historical Profiles

County Building Permits	historical data for residential and nonresidential building permits at the county level.
County Business Structure	historical data from the Bureau of Census' County Business Patterns Program for all counties by SIC industries.
County Employment and Wages	historical data for employment and wages by major industry group for all counties.
County Personal Income, Population, and Employment (BEA)	Bureau of Economic Analysis data for all 3,140 counties.

MSA Building Permits	building permit statistics at the Metropolitan Statistical Area (MSA) level for both residential and nonresidential buildings.
MSA Employment	employment, hours, and earnings data for more than 270 MSAs.
MSA Housing and Construction	includes historical housing, construction, and financial statistics for most of the 320 currently defined Standard Metropolitan Statistical Areas (SMSAs), as well as the newly defined MSAs, where applicable.
MSA Macro	macroeconomic detail for more than 300 SMSAs.
State Employment	employment, hours, and earnings data for the 50 states, the District of Columbia, the Virgin Islands, and Puerto Rico.
State Housing and Construction	national, regional, and state data covering housing, construction, and financial statistics for states.
State Industry	Annual Survey of Manufacturers data, by state, for all two-digit Standard Industrial Classification (SIC) industries plus information on origin of exports.
State Macro	macroeconomic detail for all 50 states, the District of Columbia, BEA Regions, and Census Regions.
State Financial	FDIC and FSLIC income and condition statistics for commercial banks, mutual savings banks, savings and loan associations, and federal savings banks.

International Historical Profiles

CANSIM	macroeconomic data from Statistics Canada for Canada and each Canadian province; updated daily.
Central Statistical Office (United Kingdom)	macroeconomic data for the United Kingdom.
Foreign Exchange	historical data for foreign exchange rates for 200 countries vis-à-vis the U.S. dollar.
Germany	macroeconomic national account, finance, and industry data for Germany.
IMF Balance of Payments	historical breakdowns of balance of payments data for 133 International Monetary Fund (IMF) member countries.
IMF Direction of Trade	historical trade flows by trading partner, for approximately 160 IMF member countries.
IMF International Finance Statistics	financial and macroeconomic data for 212 IMF member countries and aggregate areas.
INTLINE	macroeconomic data for 31 countries; updated daily.
Japan (NRI & NCC Co., Ltd.—NRI/e)	macroeconomic, financial, and industrial data for Japan.
OECD Annual National Accounts	historical detail for the 25 Organization for Economic Cooperation and Development (OECD) countries and three aggregate areas.
OECD Indicators of Industrial Activity	quantitative view of economic development by industry.
OECD Main Economic Indicators	covers the 25 OECD countries and aggregate areas.
OECD Quarterly National Accounts	statistics for the 13 OECD countries that prepare national accounts quarterly.
U.N. Demographics	historical and projected data for more than 165 countries and regional aggregates.
U.N. National Accounts	national income and product accounts for approximately 158 countries.
World Debt Tables	external public and publicly guaranteed debt data for 105 developing countries and 12 aggregate areas.

Industry Historical Profiles

BANKROLL II	balance sheet and income statements for commercial banks and their consolidated subsidiaries.
THRIFTROLL	contains deposit information for 85,000 branches of commercial banks, mutual savings banks, savings and loan associations, and federal savings banks.
Canadian Agriculture	detailed historical data for the Canadian agriculture sector.
Energy	supply and demand statistics for petroleum, natural gas, coal, oil, and electricity at the national, regional, and international levels.
International Fertilizer	nitrogen, phosphate, and potash data for seven regions and the world total.
International Lead and Zinc	statistical analyses provided by the International Lead and Zinc study group.
Iron and Steel	supply and demand data reported by the American Iron and Steel Institute and the International Iron and Steel Institute.

State Agriculture	covers major crops and vegetables in 48 states, 10 regional totals, and total U.S.
U.S. Fertilizer	historical nutrient product data.
U.S. Food and Agriculture	national-level agricultural data.
Ward's AutoInfoBank	historical data for supply, demand, and options data for passenger cars and trucks.

Forecast Profiles

Canadian Agriculture Forecast	forecasts of a wide range of agriculture variables.
Canadian Macroeconomic Forecast	macroeconomic forecasts for Canada, covering the real and financial sectors of the Canadian economy.
Consumer Spending Forecast	U.S. personal consumption expenditures, retail sales, and consumer credit.
Electric Utility Cost Forecast	prices, construction, and operating costs pertinent to electric utilities.
Far East Forecast	macroeconomic coverage of Australia, China (PRC), Hong Kong, India, Indonesia, Japan, the Republic of Korea, Malaysia, Pakistan, the Philippines, Singapore, Taiwan, and Thailand.
Financial Forecasts	key financial market indicators for the U.S. economy.
Foreign Exchange Forecast	exchange and interest rate forecasts for more than 30 currencies and countries.
Household Age/Income Forecast	household income distribution, population, and labor force participation.
Latin America Forecast	macroeconomic forecasts for 10 Latin American countries.
Long-term Interindustry Forecast	detailed forecasts for more than 400 industries of output, sales to major markets, investment, employment, value added, profits, and other income.
Middle East and Africa Forecast	macroeconomic forecasts for 17 countries.
OECD Forecast	macroeconomic forecasts for 11 OECD countries.
Regional Financial Forecast	forecasts of financial activity for the 50 states, the District of Columbia, and 263 Standard Metropolitan Statistical Areas (SMSAs).
Regional Industry Forecast	state industrial employment forecasts.
Regional Macro Forecast	detailed macroeconomic forecasts for all 50 states, the District of Columbia, and 276 SMSAs.
Regional Real Estate and Construction Forecast	forecasts for all 50 states, the District of Columbia, and 276 SMSAs.
U.S. Agriculture Forecast	supply, demand, and prices for major crop and livestock commodities and projections of farm cash flow variables.
U.S. Cost Planning Forecast	forecasts growth rates of prices for more than 300 industrial commodities and wage rates for over 30 industries.
U.S. Energy Forecast	U.S. energy consumption by household, commercial, and industrial sector and selected energy prices by sector.
U.S. Fertilizer Forecast	major U.S. fertilizers, including three primary nutrients—nitrogen, phosphates, and potash—and derivative fertilizer products for each nutrient.
U.S. Macroeconomic Forecast	detailed forecasts emphasizing national expenditures, income, and output.
U.S. Passenger Car and Light Truck Forecast	details about the car and truck industry by segments.
U.S. Steel Forecast	steel demand, supply, prices, and costs.
World Fertilizer Forecast	forecasts for eight producing, consuming, and trading fertilizer regions and world totals for the three primary nutrients: nitrogen, phosphate, and potash.

In addition, a compilation of The WEFA Group's data is commercially available on-line through DIALOG Information Services as the *EconBase Timeseries and Forecasts Data Base.* The database contains 10,000 time-series that begin as early as 1984 and presents the data on a monthly, quarterly, or annual basis. Updated monthly, *EconBase* contains annual forecasts for a two-year period on 1,100 major economic indicators.

Other Professional Services

The WEFA Group offers a variety of consulting services, all of which are tailored to a client's needs. The following are examples of the consulting projects and support services with which The WEFA Group has experience:

- Develop special scenarios focusing on a specific issue or country

- Develop special forecasts in response to political events affecting the economy, such as revision of the national tax laws or imposition of an oil embargo
- Advise companies on the feasibility of proposed investments and review their annual plans (e.g., whether the construction of a new nuclear power plant in a particular country should be considered)
- Build special computer workstations or design data management systems
- Research and prepare special reports
- Participate in executive briefing sessions

The WEFA Group's models are used to produce regular domestic, international, and international regional forecasts and analyses. With a large staff of professionals available for consulting, clients have access to specialists in various industries or regions.

Some clients require custom-built models to track indicators of particular interest to them. The WEFA Group supplies consultants to work with these clients in constructing their models. ■

West Publishing Company

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Synopsis

Editor's Note
West has enhanced its WESTLAW service. They company has increased its coverage of law reviews and bar journals and has almost doubled WESTLAW's access in state law libraries. In the on-line database categories, West has transformed its Federal Special Interest Libraries into Special Interest Databases, and has added several new areas of coverage.

Report Highlights
These report highlights begin with West Publishing's enhancements to its WESTLAW service such as **Shepard's Preview**—which provides current citing information for cases from the National Reporter System. Available exclusively on WESTLAW, it includes *Shepard's Citations* days, weeks, and even months before the same information appears in Shepard's Online. **SCOPE**—provides a means to instantly obtain descriptive information about databases, services, and gateways available on WESTLAW. **West CD-ROM Libraries**—the newest enhancement to the WESTLAW service. West Publishing has five topical areas on CD-ROM: Bankruptcy, Federal Civil Contracts, Government Contracts, Federal Taxation, and Delaware Corporation Law. The service is compatible with over 200 computer terminals, word processors, and microcomputers. In user support, West has upgraded its services to accommodate its customers. West's customer service representatives are technical experts who will answer almost any WESTLAW-related question a user may have. West provides reference attorneys who are experienced lawyers and can help clients formulate WESTLAW searches. Furthermore, through gateway arrangements, WESTLAW customers may access the databases offered by other vendors, such as VU/TEXT, DIALOG, and Dow Jones News/Retrieval.

Vendor
West Publishing Co.
P.O. Box 64526
St. Paul, MN 55164-0526
(612) 228-2500

Analysis

Recognized as the leading publisher of law-related information in the United States, West Publishing Company has produced information services for the legal community for more than 100 years. It introduced its on-line service, WESTLAW, in 1975. Most of the larger law firms and many small firms subscribe to this service.

WESTLAW databases include the U.S. Code, federal regulations, case law from all federal courts, and a range of specialized libraries including tax, securities, labor, bankruptcy, energy, antitrust, patents, admiralty, banking, government contracts, and international trade. Case law coverage also includes all 50 states and the District of Columbia.

WESTLAW also includes databases from other database producers including the Bureau of National Affairs, Commerce Clearing House, Public Utilities Reports, and Tax Analysts. Furthermore, through gateway arrangements, WESTLAW users can access the databases offered by outside vendors, including VU/TEXT, DIALOG, and Dow Jones News/Retrieval.

Company Background

West Publishing Company was founded in 1876 to provide lawyers with timely access to court decisions. Widely considered the leading publisher of state and federal court decisions, West became one of only two U.S. companies specializing in on-line services for lawyers when it introduced its WESTLAW on-line service in 1975.

WESTLAW provides access to federal and state case law libraries; specialized libraries on tax, securities, labor, and other practice areas; the U.S. Code; Code of Federal Regulations; the Insta-Cite case history service; Shepard's Citations; and Black's Law Dictionary.

West Publishing still derives most of its revenue from print products although use of its WESTLAW service is expanding rapidly. The company added value to WESTLAW by introducing *Full-Text Plus*, which furnishes headnotes and synopses of court cases. These summaries provide subscribers with relevant terms for searching that may not be found within the text of the case. Other recent enhancements include:

Star Paging—allows users to cite to pages within WESTLAW'S *National Reporter System* (and United States Reports) directly from a WESTLAW case law search result. Star Paging also allows a user to immediately display the beginning of any page from a case on WESTLAW that appears in the advance sheets or bound volumes of West's *National Reporter System* or United States Reports.

Personal Directory of Queries (PDQ)—this service allows users to save queries run on a particular database for later use. It eliminates the need for a user to retype frequently run searches.

Quickview—an on-line WESTLAW usage tracking system. Designed for account managers, it allows them to view and print recent usage information. Usage data is available for the previous two months and the current month.

Client ID Format—designed for subscribers who wish to have their WESTLAW users follow a predefined client identification format.

WESTLAW also contains articles selected from over 291 law reviews and bar journals, materials from the American Bar Association's *AMBAR* database, and information from the *Forensic Services Directory*.

Shepard's PreView—added to WESTLAW in 1989, provides current citing information for cases from the National Reporter System. Available exclusively on WESTLAW, Shepard's PreView provides *Shepard's Citations* days, weeks, and even months before the same information appears in Shepard's online.

SCOPE—provides a means to instantly obtain descriptive information about databases, services, and gateways available on WESTLAW. With this addition, the WESTLAW Directory has been shortened and simplified to present database names and identifiers in a concise manner. SCOPE eliminates the need to go back and page through the directory to display such information, enabling a search result to be retained while retrieving information about a database. This command is available from nearly anywhere in WESTLAW.

Shepard's PreView and Shepard's Citations—this publication provides detailed information on using Shepard's PreView, the exclusive new citator ▶

WESTLAW State Law Library Access

Alabama
Court of Civil Appeals
Court of Criminal Appeals
Court of Appeals
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Administrative Law
Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports
Taxation Administrative Decisions

Alaska
Supreme Court
Court of Appeals
Statutes (annotated)
Statutes (unannotated)
Statutes 1987 (annotated)
Insurance Statutes
Attorney General Opinions
Taxation Decisions
Public Utilities Reports

Arizona
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Legislative Service
Legislative Service 1988
Court Rules
Court Orders
Attorney General Opinions
Securities Decisions
Taxation Decisions
Public Utilities Reports

Arkansas
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Attorney General Opinions
Public Utilities Reports
Worker's Compensation Decisions

California
Supreme Court
Court of Appeal
Appellate Dept. Sup. Ct.
Statutes (annotated)
Statutes Index
Statutes 1988 (annotated)
Statutes 1987 (annotated)
Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions
Environmental Law Decisions
Securities Decisions
Taxation Decisions
BNA California Case Law Daily
California Jury Instructions
Book of Approved Jury Instructions (Civil)
California Jury Instructions-Criminal
Supplement to California Jury Instructions
Public Utilities Reports
WESTLAW State Bulletins, California

Colorado
Supreme Court
Court of Appeals
Statutes (unannotated)
Insurance Statutes
Legislative Service
Attorney General Opinions
Taxation Decisions
Taxation Administrative Guidance
Public Utilities Reports
Workers' Compensation Decisions

Connecticut
Supreme Court
Appellate Court
Superior Court
Circuit Court
Court of Common Pleas
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Legislative Service
Statutes 1988 (annotated)
Legislative Service 1988
Attorney General Opinions
Public Utilities Reports
Workers' Compensation Decisions

Delaware
Supreme Court
Court of Chancery
Superior Court
Family Court
Delaware Corporation Case Law (State and Federal)
Delaware Corporation Case Law (Federal)
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Public Utilities Reports

District of Columbia
Court of Appeals
U.S. Court of Appeals for the District of Columbia Circuit
Public Utilities Reports

Florida
Supreme Court
District Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1987 (annotated)
Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions
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Georgia
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Attorney General Opinions
Environmental Law Decisions
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Guam
Insurance Statutes

Hawaii
Supreme Court
Intermediate Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Attorney General Opinions
Public Utilities Reports

Idaho
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Attorney General Opinions
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Illinois
Supreme Court
Appellate Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1988 (annotated)

Legislative Service 1988
Legislative Service
Court Rules
Court Orders
Attorney General Opinions
Environmental Law Decisions
Taxation Decisions
Public Utilities Reports
BNA Illinois Case Law Daily
WESTLAW State Bulletins, Illinois

Indiana
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Legislative Service
Attorney General Opinions
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Iowa
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
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Court Rules
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Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports

Kansas
Supreme Court
Court of Appeals
Attorney General Opinions
Public Utilities Reports

Kentucky
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1986 (annotated)
Attorney General Opinions
Environmental Law Decisions
Taxation Decisions
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Louisiana
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
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Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
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Attorney General Opinions
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Public Utilities Reports

Maine
Supreme Judicial Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Legislative Service
Legislative Service 1988
Attorney General Opinions
Public Utilities Reports
Workers' Compensation Decisions

Maryland
Court of Appeals
Court of Special Appeals
Tax Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statues 1986 (annotated)
Court Rules
Court Orders
Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports

Massachusetts
Supreme Judicial Court
Appeals Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1987 (annotated)
Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions
Public Utilities Reports
Taxation Decisions
Workers' Compensation Decisions
WESTLAW State Bulletin, Massachusetts

Michigan
Supreme Court
Court of Appeals
Insurance Statutes
Legislative Service
Attorney General Opinions
Environmental Law Decisions
Securities Decisions
Taxation Decisions
Public Utilities Reports

Minnesota
Supreme Court
Court of Appeals
Tax Court
Statutes (unannotated)
Insurance Statutes
Statutes Index
Legislative Service
Legislative Service 1988
Court Rules
Court Orders
Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports

Mississippi
Supreme Court
Attorney General Opinions
Public Utilities Reports

Missouri
Supreme Court
Court of Appeals
Statutes (unannotated)
Insurance Statutes
Statutes Supplement
Legislative Service
Court Rules
Court Orders
Legislative Service 1988
Attorney General Opinions
Taxation Decisions
Public Utilities Reports

Montana
Supreme Court
Attorney General Opinions
Taxation Decisions
Public Utilities Reports

Nebraska
Supreme Court
Insurance Statutes
Attorney General Opinions
Public Utilities Reports
Workers' Compensation Decisions

Nevada
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Attorney General Opinions
Public Utilities Reports

New Hampshire
Supreme Court
Attorney General Opinions
Taxation Decisions
Public Utilities Reports

New Jersey
Supreme Court (formerly Court of Errors and Appeals)
Superior Court (formerly Court of Chancerly, Supreme Court of Prerogative Court)
Tax Court
Statutes (unannotated)
Insurance Statutes
Statutes Index
Legislative Service
Attorney General Opinions
Public Utilities Reports

New Mexico
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1986 (annotated)
Attorney General Opinions
Public Utilities Reports

New York
Court of Appeals
Supreme Court App. Div.
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1987 (annotated)
Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions
Comptroller Opinions
Environmental Law Decisions
Taxation Decisions
Taxation Administrative Guidance
Public Utilities Reports
BNA New York Case Law Daily
WESTLAW State Bulletins, New York

North Carolina
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1986 (annotated)
Attorney General Opinions
Public Utilities Reports

North Dakota
Supreme Court
Court of Appeals
Attorney General Opinions
Public Utilities Reports

Ohio
Supreme Court
Court of Appeals
Unreported decisions from Court of Appeals
Court of Common Pleas
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1986 (annotated)
Legislative Service
Legislative Service 1988
Attorney General Opinions
Environmental Law Decisions
Taxation Decisions
Public Utilities Reports
WESTLAW State Bulletin, Ohio

Oklahoma
Supreme Court
Court of Criminal Appeals
Court of Appeals
Judiciary Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1988 (annotated)
Legislative Service
Legislative Service 1988
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions
Public Utilities Reports

Oregon
Supreme Court
Court of Appeals
Tax Court
Insurance Statutes
Attorney General Opinions
Public Utilities Reports

Pennsylvania
Supreme Court
Superior Court
Commonwealth Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Legislative Service
Legislative Service 1988
Court Rules
Court Orders
Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports
Securities Decisions
Workers' Compensation Decisions

Rhode Island
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1986 (annotated)
Attorney General Opinions
Public Utilities Reports

South Carolina
Supreme Court
Court of Appeals
Attorney General Opinions
Public Utilities Reports

South Dakota
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1988 (annotated)
Attorney General Opinions
Public Utilities Reports

Tennessee
Supreme Court
Court of Appeals
Court of Criminal Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1986 (annotated)
Attorney General Opinions
Environmental Law Decisions
Public Utilities Reports

Texas
Supreme Court
Court of Civil Appeals
Court of Criminal Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes Index
Statutes 1987 (annotated)
Legislative Service
Legislative Service 1987
Court Rules
Court Orders
Attorney General Opinions Securities Decisions
Taxation Decisions
Public Utilities Reports
WESTLAW State Bulletins, Texas

Utah
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Attorney General Opinions
Public Utilities Reports

Vermont
Supreme Court
Attorney General Opinions
Taxation Decisions
Public Utilities Reports

Virgin Islands
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Legislative Service

Virginia
Supreme Court
Court of Appeals
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Statutes 1988 (annotated)
Attorney General Opinions
Corporations Decisions
Public Utilities Reports

Washington
Supreme Court
Court of Appeals
Insurance Statutes
Legislative Service
Attorney General Opinions

Environmental Law Decisions
Public Utilities Reports

West Virginia
Supreme Court
Statutes (annotated)
Insurance Statutes
Statutes (unannotated)
Statutes 1987 (annotated)
Attorney General Opinions
Public Utilities Reports

Wisconsin
Supreme Court
Court of Appeals
Insurance Statutes
Legislative Service
Court Rules
Court orders
Attorney General Opinions
Environmental Law Decisions
Taxation Decisions
Public Utilities Reports

Wyoming
Supreme Court
Statutes (annotated)
Insurance
Statutes (unannotated)
Statutes 1988 (annotated)
Attorney General Opinions
Public Utilities Reports

▶ *(Analysis continued)*

service developed by Shepard's/McGraw-Hill, Inc. and West Publishing Company. The supplement also describes the recent enhancements to Shepard's Citations on WESTLAW.

West CD-ROM Libraries—important relevant information for various types of research is provided. There are five topical areas available on CD-ROM, which are discussed in more detail in the Competitive Position section.

West Publishing Company is privately held and does not release revenue information.

Competitive Position

West may be the undisputed leader in the (print) legal publishing market for printed materials; the *on-line* market is another matter. Its WESTLAW on-line service has only one competitor—Mead Data Central's (MDC's) LEXIS service. From all accounts, LEXIS has about 75 percent of the market, although WESTLAW is gaining on it. Much of the market, however, remains unclaimed, as many smaller law firms have yet to sign up with either service.

Recently, West and Mead extended their commercial battle into the courtroom. At stake was MDC's right to use West's "star paging" numbering system within its LEXIS service. The three-year battle ended in mid-1988, with a settlement calling for MDC to pay West a licensing fee for the right to use the numbering scheme. Although the exact terms of the settlement were not made public, it's unlikely it will affect market share.

Both West and MDC are exploring other distribution methods, such as CD-ROM. The West CD-ROM Libraries service provides all relevant information for various types of research on just a few compact disks. The libraries available are:

- Bankruptcy
- Federal Civil Contracts
- Government Contracts
- Federal Taxation
- Delaware Corporation Law

CD-ROM distribution is still new; few companies, libraries, or law firms use CD-ROMs for information retrieval. Yet, optical publishing can potentially supplant on-line delivery for all but the most current information. In the future, West's and MDC's positions in the marketplace could hinge on how they use this technology.

Resources and Facilities

Processing Center

West Publishing Company's computer center is located at its headquarters in St. Paul, Minnesota. Several IBM mainframe computers operate the WESTLAW databases and services.

Customer Support Services

West Publishing Company trains subscribers both at the client's site and at its regional training centers. West's support services include a customer service hot line, free query help, on-line courses, seminars and workshops, printed references, and updating services.

West's customer service representatives are technical experts who will answer almost any

WESTLAW-related question. West reference attorneys are experienced lawyers who help clients formulate their WESTLAW searches.

Sales And Marketing Service

West provides customer service representatives, sales representatives, training centers, and reference material.

Customer Service—available seven days a week to take questions, comments, and requests. The representatives are extensively trained and are available for support.

Reference Attorneys—provide reference information about using West products—West legal books and WESTLAW. These attorneys, available for questions and requests, have extensive experience, both practising law and assisting West customers.

Account Representatives and Account Executives—provide assistance to novice and experienced WESTLAW users with initial, advanced, and topical training seminars. Most of these representatives and executives are attorneys.

Training Centers—provide a setting away from the office for WESTLAW training. Available now in more cities, such as Kansas City, Denver, Minneapolis, and Salt Lake City, these centers enable several people from one office to train without tying up the library or a conference room. For more information, contact West's headquarters in St. Paul, Minnesota.

Application-Specific Services

West's principal electronic product is WESTLAW, a computer-assisted legal research service. WESTLAW includes the full text of primary and secondary sources of federal and state law. It also provides access to citation services, including Shepard's Citations and Insta-Cite.

Networking Services

WESTLAW is available 24 hours per day during the week; 22 hours on Saturday (until 10 p.m., Central time); and 18 hours on Sunday (from 6 a.m., Central time). The system can be accessed via Tymnet, Telenet, leased lines, and WESTNET (West's own network).

WESTLAW subscribers pay a monthly subscription fee of approximately $125 plus hourly database fees and connect and communications charges. Users who commit to three hours of use per month are billed at lower hourly fees. WESTLAW also offers off-line printing capabilities billed on a per-line basis.

WESTLAW is compatible with over 200 models of computer terminals, word processors, and microcomputers. Users may provide their own compatible equipment, or they may lease or purchase custom-designed equipment from West. West's Automatic Law Terminal (WALT II) is designed to save the WESTLAW user time and keystrokes.

WESTLAW subscribers who use dial-up equipment for WESTLAW can also access other on-line services.

On-Line Databases

WESTLAW offers a wide variety of full-text databases. West's case law databases combine the full text of court opinions with its unique indexing system—the Key Number system. The combination of full-text and editorial additions enables WESTLAW users to perform both free-text and conceptual searches.

Brief descriptions of WESTLAW's databases follow. Most of these databases are also described in detail in the On-line Databases section (Tab OL40) of this publication.

Federal Statutory Law

The U.S. Code	the complete, official text of the U.S. Code, including appendixes and court rules.

Administrative Law

Code of Federal Regulations	50 titles of the Code of Federal Regulations, including current federal administrative regulations.
Federal Register	federal regulations before they are added to the Code of Federal Regulations. Includes the semiannual Unified Agenda describing activities of the cabinet departments and other executive agencies.
Presidential Documents	Executive Orders and Presidential Proclamations from 1936 to date.

Federal Case Law

Supreme Court Reporter	U.S. Supreme Court cases from 1790 (the court's inception) to date. The cases appear on-line the same day they are handed down.
Federal Reporter, 2nd and 1st	U.S. Courts of Appeals Decisions, Court of Customs and Patent Appeals cases, Temporary Emergency Court of Appeals, and the Court of Claims Decisions. U.S. Courts of Appeals decisions date back to 1891 (inception of the court).
Federal Supplement	U.S. District Court Decisions, Court of International Trade cases (formerly Customs Court), Special Court Regional Rail Reorganization Act, Judicial Panel on Multidistrict Litigation, and Court of Claims. The database dates to 1789 (the court's inception) for U.S. District Court decisions.
Federal Rules Decisions	federal rules decisions from 1976 to date.
U.S. Court of Appeals for the Federal Circuit	decisions of the former U.S. Court of Claims, and decisions of the former U.S. Court of Customs and Patent Appeals.
U.S. Claims Court	beginning with 1 Claims Court 1982 to present. Courts of Military Appeals and Court of Military Review cases date back to 1951.

Special-Interest Databases

WESTLAW'S Special Interest Databases provide collections of state and federal statutes, case law, text, periodicals, or administrative materials covering the following areas:

- Administrative Law
- Admiralty
- Antitrust & Business Regulation
- Bankruptcy
- Communications
- Corporations
- Criminal Justice
- Education
- Energy
- Environmental Law
- Family Law
- Financial Services
- First Amendment
- Health Services
- Government Contracts
- Immigration
- Insurance
- Intellectual Property
- International Law
- Jurisprudence & Constitutional Theory
- Labor
- Legal Services
- Litigation
- Military Law
- Real Property
- Securities
- Taxation
- Tort Law
- Transportation
- Workers Compensation

State Law Databases

The state libraries include the decisions of the appellate courts from all 50 states and the District of Columbia. State special-interest databases provide case law on education, family law, insurance, securities, corporations, environmental law, legal services, taxation, and workers' compensation. State statutes are currently available for more than 20 states. In addition, the state libraries cover administrative law materials such as attorney general decisions and tax material from selected states.

Miscellaneous Databases

AMBAR	abstracts on publications, programs, activities, and products of the ABA. This file is compiled by the American Bar Association.
Billcast	summaries of public bills introduced in the current session of the U.S. Congress, excluding those introduced in the Appropriations and Budget Committees.
Black's Law Dictionary	the DI service contains definitions of terms and phrases of American and English Jurisprudence, both ancient and modern that appear in Black's Law Dictionary, 5th Edition.

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Recently Added WESTLAW Services

Citators
Shepard's PreView, provides current citing information for cases from the National Reporter System. Available exclusively on WESTLAW, Shepard's PreView provides *Shepard's Citations* days, weeks, and even months before the same information appears in Shepard's online. Also added coverage of *Shepard's Federal Labor Law Citations*, *Shepard's Federal Administrative Citations*, and *Shepard's Federal Citations in Selected Law Reviews*.

U.S. Legislative History and Public Laws
U.S. Code Legislative History (LH) and U.S. Public Laws (US-PL).

Federal Financial Services
Federal Deposit Insurance Corporation Decisions and Interpretive Letters (FFIN-FDIC)

Federal Government Contracts
Veterans Administration General Counsel Opinions (FGC-VAGC)

Federal Immigration
Board of Immigration Appeals Administrative Decisions (FIM-BIA)

Federal International Law
Federal Cases (FINT-CS)
Supreme Court (FINT-SCT)
Courts of Appeals (FINT-CTA)
District Courts (FINT-DCT)
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Rules (FMIL-RULES)
Federal Register (FMIL-FR)
Code of Federal Regulations (FMIL-CFR)
Texts and Periodicals (FMIL-TP)

Manual for Courts-Martial (FMIL-MCM)

Federal Legal Services
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Federal Taxation
Internal Revenue Service Announcements and Notices (FTX-ANN)

Federal Transportation
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Supreme Court (FTRAN-SCT)
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Code of Federal Regulations (FTRAN-CFR)

Interstate Commerce Commission Decisions (FTRAN-ICC)
Department of Transportation Aviation Decisions (FTRAN-DOT)

State Databases
Arizona Tax Court Cases (AZTX-TCT)

State Statutes
143 new statute-related state databases and updated another 105 statutory databases. State Statutes are covered more thoroughly in Table 2. FIND was released for state statutes, giving you instant access to statutes when you know the citation. Related Materials, such as UPDATE, were also made available to provide you with comprehensive information on state law.

Indexes
Arizona Statutes—General Index (AZ-ST-IDX)
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Oklahoma Statutes—General Index (OK-ST-IDX)
Pennsylvania Statutes—General Index (PA-ST-IDX)
Washington Statutes—General Index (WA-ST-IDX)

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State Administrative Codes

Texas Administrative Code (TX-ADC)

State Administrative Decisions

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Alabama Environmental Law Administrative Decisions (ALENV-ADMIN)
California Environmental Law Administrative Decisions (CAENV-ADMIN)
Georgia Environmental Law Administrative Decisions (GAENV-ADMIN)
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Michigan Environmental Law Administrative Decisions (MIENV-ADMIN)
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Multistate Environmental Law Administrative Decisions (MENV-ADMIN)

Securities

Arizona Securities Administrative Decisions (AZSEC-ADMIN)
Multistate Securities Administrative Decisions (MSEC-ADMIN)
Missouri Securities Administrative Decisions (MOSEC-ADMIN)
Pennsylvania Securities Administrative Decisions (PASEC-ADMIN)

Taxation

Alabama Taxation Administrative Decisions (ALTX-ADMIN)
Arizona Taxation Administrative Decisions (AZTX-ADMIN)
California Taxation Administrative Guidance (CATX-ADG)
Ohio Taxation Administrative Decisions (OHTX-ADMIN)
Multistate Taxation Administrative Guidance (Contains CATX-ADG, COTX-ADG and NYTX-ADG) (MTX-ADG)
New York Taxation Administrative Decisions (NYTX-ADMIN)
New York Taxation Administrative Guidance (NYTX-ADG)

Workers' Compensation

Arkansas Workers' Compensation Administrative Decisions (ARWC-ADMIN)
Colorado Workers' Compensation Administrative Decisions (COWC-ADMIN)
Connecticut Workers' Compensation Administrative Decisions (CTWC-ADMIN)
Maine Workers' Compensation Administrative Decisions (MEWC-ADMIN)
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Multistate Workers' Compensation Administrative Decisions (MWC-ADMIN)
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Oregon Workers' Compensation Administrative Decisions (ORWC-ADMIN)
Pennsylvania Workers' Compensation Administrative Decisions (PAWC-ADMIN)

State Energy Law

Individual State Energy Cases (XXEN-CS) (where XX is the two-letter state postal abbreviation)
Multistate Cases (MEN-CS)

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Individual Environmental Law Cases (XXENV-CS) (where XX is the two-letter state postal abbreviation)
Multistate Cases (MENV-CS)

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Individual State Legal Services Cases (XXLS-CS) (where XX is the two-letter state postal abbreviation)
Multistate Legal Services Cases (MLS-CS)

State Workers' Compensation

Individual State Worker's Compensation Cases (XXWC-CS) (where XX is the two-letter state postal abbreviation)
Multistate Workers' Compensation Cases (MWC-CS)

State Bulletins

California (WSB-CA)
Florida (WSB-FL)
Illinois (WSB-IL)
Louisiana (WSB-LA)
Massachusetts (WSB-MA)
New Jersey (WSB-NJ)
New York (WSB-NY)
Ohio (WSB-OH)
Pennsylvania (WSB-PA)
Texas (WSB-TX)

Highlights

WESTLAW Topical Highlights—Education (WTH-ED)
WESTLAW Legal Bulletin—U.S. Supreme Court (WLB-SCT)

Texts & Periodicals

ABA Journal (ABAJ)
Albany Law Review (ABYLR)
Army Lawyer (ARMLAW)
Bankruptcy Developments Journal (BKRDEVJ)
Columbia Business Law Review (CLMBLR)
Cooley Law Review (COOLLR)
George Mason University

Law Review (GMULR)
Issues in Law & Medicine (ISSULM)
Journal of Law & Politics (JLPOL)
Judicature (JUDICATURE)
Military Law Review (MILLR)
Stanford Environmental Law Journal (STENVLJ)
Workers' Compensation Texts & Periodicals (WC-TP)

Other Publishers' Materials

WESTLAW Gateways
DowQuest (DOWQUEST)
McGraw-Hill News (MH-NEWS)

ABA Ethics Materials
American Bar Association Ethics Opinions (LS-ABAEO)
Model Rules of Professional Conduct (LS-MRPC)
Code of Judicial Conduct (LS-CJC)

American Judicature Society
Judicature (JUDICATURE)
Judicial Conduct Reporter (JCR)

Bureau of Alcohol, Tobacco and Firearms
Bureau of Alcohol, Tobacco and Firearms Quarterly Bulletin (ATF)

The Bureau of National Affairs, Inc.
BNA Bankruptcy Law Daily (BNA-BLD)
BNA Product Liability Daily (BNA-PLD)
BNA Patent, Trademark and Copyright Law Daily (BNA-PTD)

Chinalaw Computer-Assisted Legal Research Center
Laws and Regulations of the People's Republic of China (CHINALAW)

Clark Boardman Company, Ltd.
Acquisitions and Mergers: Negotiated and Contested Transactions (CB-SEC11)
Bankruptcy Law Fundamentals (CB-BKRFUND)
Exempted Transactions Under the Securities Act of 1933 (CB-SEC7)
Federal Rules of Bankruptcy (CB-BKRULES)
Going Public and the Public Corporation (CB-SEC1)
Herzog's Bankruptcy Forms and Practice (CB-BKRFP)
International Capital Markets and Securities Regulation (CB-SEC10)
Opinion Letters in Securities Matters (CB-SEC8)
Securities and Federal Corporate Law (CB-SEC3)
Securities & Partnership Law for MLPs & Other Investment Limited Partnerships (CB-SEC14)
Venture Capital and Small Business Financings (CB-SEC2)

Commerce Clearing House, Inc.
CCH's North American Securities Administrators Association, Inc. (NASAA) Reports (CCH-NASAA)

Marian Gould Gallagher Law Library at the University of Washington
Current Index to Legal Periodicals (CILP)

International Economic Law Interest Group of the American Society of International Law
International Economic Law Documents (IEL)

Prentice Hall Information Services
Prentice Hall Federal Taxes (PH-FTX)
Index to Prentice Hall Federal Taxes (PH-FTXINDX)

Prentice Hall Law & Business
Prentice Hall Law & Business Directory of Corporate Counsel (CORP-DIR)

Securities Filings
SEC Corporate Filings (SEC-ONLINE)
Mergers and Acquisitions Filings (M&A)

Wakeman/Walworth

From the State Capitals

Banking Policies (FTSC-BP)
Civil Rights (FTSC-CR)
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Justice Policies (FTSC-JP)
Labor Relations (FTSC-LR)
Public Utilities (FTSC-PU)
Taxation and Revenue Policies (FTSC-TRP)
Taxes—Property (FTSC-TP)
Waste Disposal and Pollution Control (FTSC-WDPC)
Women and the Law (FTSC-WL)

Tax Management, Inc.
Tax Management Portfolios—Foreign Income Series (TM-FOR)

Database Extensions & Expansions

Coverage for each of the following databases was extended back to the date listed in parentheses:

California Court of Appeals (1945) (CA-CS)
California Appellate Department Superior Court (1945) (CA-CS)
Maryland Public Utilities Reports (1977) (MD-PUR)
National Transportation Safety Board Decisions (1967) (FTRAN-NTSB)
New York Court of Appeals (1913) (NY-CS)
New York Supreme Court Appellate Division (1913) (NY-CS)
New York Supreme Court (1913) (NY-CS)
New York Miscellaneous Courts of Record (1913) (NY-CS)
Virginia Supreme Court (1925) (VA-CS)
Virginia Court of Appeals (1925) (VA-CS)
West's Regional Reporter databases now include "quick opinions," opinions not scheduled to be reported and some tax court decisions (ATL, NE, NW, PAC, SE, SW and SO)

New Feature

Increased Options
With the new OPTIONS command, you can customize your WESTLAW session and make your research easier. The OPTIONS command lets you tell WESTLAW to take certain actions automatically, without you having to tell it each time.

These choices are "permanent" until you change the default.

▶ *(Analysis continued)*

Miscellaneous Databases (Continued)

BNA	material from the Bureau of National Affairs covering such areas as tax, antitrust, patents, pensions, labor, securities, and financial institutions.
Case Highlights	current state and federal cases from around the country of general interest and significance to lawyers.
CCH Blue Sky Reporter	includes state statutes, blue sky laws, state rules and regulations issued by the blue sky regulatory authority, uniform securities act, federal and state court decisions, commentary, and other secondary materials.
CCH Tax Day: Federal	published by Commerce Clearing House, provides digests of all new federal tax developments.
CCH Tax Day: State	recent tax developments in the 50 states including major legislation, court decisions, administrative rulings, and releases.
Forensic Services Directory	lists expert and technical consultants, plus translators, testing laboratories, investigators, and other specialists who provide trial support services. The directory is compiled by the National Forensic Center.
Index to Legal Periodicals and Legal Resource Index	both major indexes to legal articles in law reviews, periodicals, and journals. The *Current Index to Legal Periodicals* serves as a current awareness tool and updates other legal periodicals indexes.
Public Utility Reports	court cases and Public Utility Commission decisions; produced by Public Utility Reports, Inc.
Tax Notes Today, Tax Notes, and Tax Notes International	daily and weekly tax reviews prepared by Tax Analysts, Inc.

Gateways

Through gateway arrangements, WESTLAW subscribers can gain on-line access to databases and other on-line services from DIALOG, Dow Jones News/Retrieval, VU/TEXT, PHINet, PaperChase, Dun and Bradstreet, Credit Services, DowQuest, and State Net.

Other Services

Full-Text Plus is a special feature that provides editorially prepared synopses and headnotes of full-text cases issued by the courts. The synopses and headnotes often include relevant search terms that do not appear in the text. The synopsis also gives the user a concise overview of the decision. According to West, users of this feature can retrieve 15 percent more cases containing search terms than those using text-only services.

Insta-Cite is a case history service developed for computer-assisted legal research. Described as a citation verifier, Insta-Cite lists the prior and subsequent history of cases, as well as precedential treatment.

Shepard's Citations allows researchers to "Shepardize" cases that appear on the screen or cases that are entered separately. Shepard's includes the subsequent history of a case, other cases that have cited the case, and notations as to how the case is treated in the citing cases. Researchers can rapidly move between the original case, Shepard's listing, and cases cited in a list.

Shepard's PreView is a new companion citation service jointly developed by Shepard's/McGraw-Hill, Inc. and West Publishing Company. This service provides a preview of the citing references that will later appear in Shepard's federal and state citators carrying West's National Reporter System citations. Shepard's PreView enables WESTLAW users to update Shepard's Citations results with just one command.

FIND enables researchers to retrieve and review any cited or referenced case. FIND can be used many times in sequence, while preserving the original search document.

West also offers *MCI Mail* as an extra service to all WESTLAW subscribers. MCI Mail enables users to send both electronic and hard copy messages anywhere in the U.S. All WESTLAW subscribers automatically become MCI subscribers at no extra charge. The user pays only for the MCI services that are used.

The *Briefcase* service allows users to order appellee, appellant, and reply briefs from Supreme Court and Federal Court of Appeals cases. *Briefcase* orders are processed by Federal Document Retrieval, Inc. A variety of pricing and delivery options are available. ■

Supplementary General Index

NOTE: This Supplementary General Index includes only the items which have been updated in the March 1987, April 1987 and May 1987 issues to Volume 2 of the DATAPRO DIRECTORY OF ON-LINE SERVICES. For index references to all previously published reports, please turn to the cumulative index on page RC05-100-101.

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The corporate drive to "distributed processing," begun during the early 1980s, is now in full throttle. Computer power is shifting from monolithic, stand-alone mainframes to the more widely distributed personal computers, bringing computing power to more people (and companies) in the process. Consequently, the remote computing services (RCS) industry has changed considerably since its genesis in the mid-1960s. Time-sharing remains a way for companies with data processing needs to tap into the mainframe's computing power without buying the equipment. Today, however, many time-sharing companies also offer "value-added services" including software, turnkey systems, and facilities management.

This report looks at remote computing services in terms of how they have evolved over the years and the services they now offer. Also included is a discussion of user benefits and disadvantages, a guide for selecting and evaluating remote computing services, and comparison columns describing the characteristics and applications offered by more than 370 remote computing companies.

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The term time-sharing, or *remote computing*, means tapping into the power of a remote computer via a (traditionally) dumb terminal located on-site. Time-sharing services offers a reasonably cheap and convenient way for companies to handle their data processing tasks. Remote computing originated in the 1960s, an era when software was rare and expensive and microcomputers were nonexistent. Time-sharing services enabled small and midsized companies to use the power of large mainframe computers without investing in machinery or hiring their own data processing staffs. While traditional time-sharing services are still in demand, the time-sharing industry of the late 1980s looks much different than the industry did just a few years ago.

RECENT RCS HISTORY

While the remote computing services (RCS) industry flourished in the mid-1960s, and throughout the '70s into the early '80s, the past couple of years have not been good to time-sharing vendors. In 1985, the last year for which figures are available, overall RCS revenues increased by only $19 million, according to Newton-Evans Research Company, a market research company. The industry still represents a $4.3 billion market, however.

Beginning about 1983, many remote computing services companies were forced to take a hard look at what they do best—and then consider moving into another direction. The market for their services was eroding, meaning they had to either adapt to the changing environment, or face ever-decreasing revenues. Some RCS companies did enter other markets—away from the provision of time-sharing services. For some, this meant selling software, selling turnkey systems, or providing computer services such as facilities management. Even those still providing remote computing services "diversified their portfolios" to avoid becoming overly reliant on the shrinking market for time-

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CompuServe Incorporated provides value-added telecommunications network services to major United States corporations and government agencies. CompuServe is also the largest supplier of videotex services in the U.S. A fisheye view of the computer room in Columbus, Ohio shows mainframes and terminals.

sharing services. Other companies, unable (or unwilling) to compete in this changing market, have been acquired by *Fortune* 500 companies (e.g., McDonnell Douglas' acquisition of Tymshare and General Motors' acquisition of Electronic Data Systems).

The downturn in the RCS business caused some of the industry's own members to label time-sharing anachronistic. One vendor now broadcasts its cleverness at having seen "the handwriting on the wall" early. On Page 1 of its glossy marketing brochure, CompuServe President Charles McCall boasts, "In the sixties CompuServe was one of the first companies to move from computer time-sharing to communications services such as electronic mail and value-added network services." Later in the same brochure, in a section describing its annual revenue growth, CompuServe states that its "transition from a time-sharing data processor to a value-added network carrier and electronic communications vendor has been marked by dramatic financial growth." CompuServe's implication is clear: moving away from time-sharing was a wise move.

What Happened?

Quite simply, many large corporate users now handle their data processing tasks in-house. Instead of sending their payroll or other time-sharing applications to an outside vendor for processing, many companies are buying the hardware and software they need in order to perform DP tasks themselves. A new generation of microcomputers costing only $10,000, which offer the processing power previously available only from small mainframes or $100,000 minicomputers, is now available. Expenditures for such hardware and software now make up a significant part of many companies' data processing budgets, leaving less money for remote computing applications.

The factor most responsible for this shift to in-house processing is the proliferation of the microcomputer. In fact, the decrease in RCS revenues neatly coincides with the microcomputer's ascension. When time-sharing was first commercialized in the mid-'60s, microcomputers were nonexistent. Businesses didn't buy microcomputers on a large scale, until 1982, following the introduction of the IBM personal computer. Soon after that, time-sharing concerns began to see their revenues shrink. With microcomputers came cheaper software, which has also helped companies move data processing tasks in-house.

The downturn in the remote computing industry also started right before the computer industry as a whole experienced a slump (which the industry is only now rebounding from).

TIME-SHARING SERVICES TODAY

Despite the events just recounted, there *is* a market for traditional time-sharing services, reduced as it may be from the halcyon days of the '70s. As mentioned, remote computing services still represent more than a $4 billion market. Many time-sharing vendors, although they have diversified into other areas that now provide a larger part of their revenues, have retained remote computing services in order to serve their existing customer base.

Entering the Business with Open Eyes

There continue to be newcomers to the RCS business. GENIX, a Pittsburgh-based company established in 1984, is one. These newcomers, however, enter the RCS industry alert to the market conditions they'll face. For example, although GENIX identifies itself as a time-sharing concern, it also does facilities management work.

GENIX reports its typical time-sharing customer is a manufacturing company that doesn't want to do its own processing. GENIX solicits business only from larger customers, having chosen "not to bother with smaller customers."

GENIX's reliance on larger companies for its business is significant. It implies there are firms with the resources available to do their own data processing in-house, but which have no desire to get into the DP business. Local and city governments, as well as the federal government, are often cited as examples of such "firms." Other industry sectors likely to rely on time-sharing services for the foreseeable future include manufacturing, utilities, and banking, according to International Data Corporation.

The Specialist Approach

Time-sharing companies are also specializing. Few RCS vendors now attempt to provide services in every possible applications area. Many are targeting their services to specific market niches, such as medical office management, engineering, and financial. The company then concentrates its resources in the chosen application(s), building a solid library of programs, developing a staff of technically knowledgeable field personnel, and promoting a reputation of expertise in that specialty.

Vending Hardware, Software, and Other Services

Other time-sharing vendors are customizing generalized packages to fit specific needs. In fact, the provision of value-added equipment and services (e.g., customer-premises hardware, licensed software, and specialized databases) is now standard in many RCS firms. In the process, they are offering software products and turnkey systems—selling their former customers the same applications software they had been running on their computers for clients to buy, own, and bring in-house to run on their own computers. In many cases, customers are using these PC-based software packages with their remote mainframes and supercomputers. Other services offered by time-sharing companies include networking services, disaster recovery services, facilities management, and special consulting and training programs.

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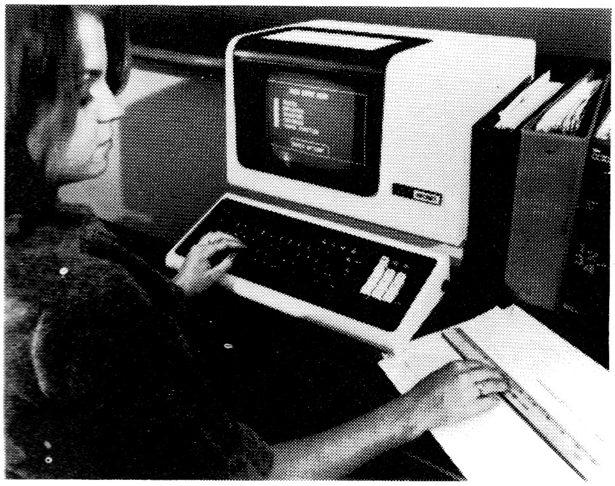

Using a menu of functions called up on the screen, clerical personnel can enter data and generate reports on video input terminals supplied with Computer Sciences Corporation's Infonet Distributed Network Service. High-level languages, data-handling utilities, and Infonet's Manage database management system also allow programmers to quickly develop new applications on the terminal.

Almost every major RCS vendor now provide hardware to customers performing various but relatively limited processing functions in-house; remote computing services for large or special jobs are still offered. Equipment offerings range from simple data entry stations, specialty terminals (e.g., POS, graphics), remote line printers, and other nonintelligent devices to intelligent workstations, microcomputers, minicomputers, and in some cases, full-blown mainframes.

By moving into other areas, time-sharing companies have managed to preserve their customer bases, even though they've had to give up some of their time-sharing revenues.

Supercomputers—A New Opportunity for Time-sharing Vendors

While the picture for traditional time-sharing services is bleak, RCS vendors do have at least one *new* market available. An area that is growing significantly is time-sharing applications for supercomputers—phenomenally expensive machines used for such diverse tasks as weather forecasting and oil exploration. *Business Week*, citing a recent report by the market research firm Dataquest, estimated the 1987 market for supercomputers would rise 30 percent over the 1986 level. The business publication pegs the current worldwide market for supercomputers at $600 million.

Just as companies specialized in offering mainframe time-sharing in the late 1960s, the 1970s, and into the early 1980s, now companies offering supercomputer time-sharing are appearing. These companies include established *Fortune* 500 firms such as Control Data Corporation, as well as smaller companies such as Opticom Corporation, of San Jose, California.

WHY REMOTE COMPUTING?

In an era of rapidly falling hardware and software prices, why have an outside firm handle your data processing tasks? First, depending on the amount of actual usage, it is sometimes cheaper to use a small piece of a large computer system than most or all of a small system. Some users prefer not to deal with the problems of ownership and are willing to pay a little more for the peace of mind gained by relying on an outside company to fix whatever goes wrong. (However, a significant number of users *have* found the economics and performance of microcomputer systems can justify doing the job in-house.)

Another strong incentive for using remote computing is ease of use. The typical user needs to train only a terminal operator, not an entire staff of computer operators, programmers, maintenance personnel, etc. Remote computing users have found it is more cost-effective for a central computing facility, like a remote computing company, to absorb these costs and then distribute the computing resources among many users.

Even corporations with extensive in-house computing facilities still use remote computing services. A number of circumstances justify the use of time-sharing services by these companies. For example, a company's in-house facilities might be devoted to "high-priority" processing (perhaps production management or billing), with little time left for secondary processing functions such as personnel or statistical reporting. It also allows a company to get rid of sticky one-shot problems or complex but infrequent jobs that are not worth the time and expense to develop and maintain in-house. A remote computing company can effectively supply the supplementary resources needed to perform these and similar functions.

User Benefits

Commercial remote computing services offer many benefits to their users. Here are some of the principal reasons for using remote computing services.

- *Flexibility*—Remote computing enables you to buy only as much computing power as you need and (except for fixed terminal costs and minimum service charges) to pay only for what you use. Thus, you can effectively "stretch" or "shrink" the size of your computer installation from day to day as your work load expands or contracts. You can use a remote computing service to handle the peak-period overloads of your in-house computer system. You can explore the possibilities of centralized databases and management information systems at comparatively low costs and without any long-term commitments. What's more, you can deal simultaneously with two or more remote computing companies and take advantage of their different pricing structures, languages, and program libraries.

- *Specialized expertise*—Many RCS companies offer remote computing products dedicated to providing a specific type of service. Examples include dedicated systems for hospital accounting, automobile dealer accounting, text editing, and civil engineering computations.

- *Ease of use*—In general, remote computing terminals are straightforward in operation and easy to learn and use. High-level programming languages, together with conversational-mode compilers and debugging aids, have made programming quite simple and fun to learn. The comparative simplicity of the terminals and their ease of use have made interactive time-sharing an accepted mode of operation for many engineers and accountants.

- *Choice of languages*—Most remote computing suppliers offer a choice of several programming languages, making it possible for each user within an organization to work with the language that best suits his or her own background and the problem at hand.

- *Application programs*—Most of the commercial remote computing companies provide ready-made programs for specific applications. The availability of suitable application programs can save a user thousands of dollars in programming costs and get them up and running much sooner.

- *Value-added networks*—An increasing number of companies now offer nationwide communications networks through which users who are scattered around the country can access one another. Consequently, they enjoy the benefits of a widespread communications network with centralized files at a fraction of the cost of establishing and operating their own. Some of the most prominent network offerings include Tymnet, Autonet, GE Information Services, and CompuServe. Tymnet is the largest public network, having over 2,800 nodes in 600 U.S. metropolitan areas and more than 68 foreign countries.

- *Disaster recovery*—The need for backup in the event of a disaster that threatens a company's data center is a hot topic these days. Many RCS companies have responded to this need by offering disaster recovery packages as part of their service offerings. Some companies offer services whereby customers use RCS computers to store backup copies of files and programs at the center for use in an emergency. Other companies provide an operational computer and peripherals, as well as personnel, for use by the stricken company until its damaged data center is operational.

Possible Drawbacks

Despite the many advantages, remote computing can be a mixed blessing. Here are some aspects of remote computing that could present problems.

- *Reliability*—This question should be uppermost in the minds of prospective remote computing users: Just how reliable is the service? Overall, the reliability of the existing remote computing services is more than adequate for most computational applications. Most system "crashes" are quickly resolved and are followed by effective recovery procedures that minimize their impact upon users' operations. But companies contemplating the use of remote computing for business data processing, where important files must be stored and processed on a timely basis with minimal errors, should carefully consider the reliability aspect.

- *Data security*—When multiple users share a computer system, safeguarding the confidentiality and integrity of each user's programs and data files can be a challenge. Most of the commercial remote computing services are acutely aware of this security problem and have combined special access protection with passwords and a variety of other techniques. Prospective users of any remote computing system should make sure the available security provisions will adequately protect their interests.

- *System loading*—In addition to downtime resulting from the reliability problems discussed previously, a remote computing system may be unavailable when needed because the system is "saturated." Saturation occurs when a remote computing system is accessed by the maximum number of users it can handle simultaneously. As the load on a system grows, response times typically increase, turnaround times get longer, and throughput drops. Finally, when saturation is reached, no more users can be served until someone completes his or her job and disconnects. Unfortunately, the heavy system loading conditions that are so frustrating for users often translate into high profits for the suppliers.

PLANO COMMAND CENTER

The view from inside one of Electronic Data Systems' regional Information Processing Centers.

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- *Communications costs*—Unless you choose a remote computing company that offers "free" or fixed-cost local access in your area, communications costs can easily represent the largest component of your remote computing bill. One problem is that it is usually necessary to use standard voice grade telephone lines, with a practical data-carrying capacity of 4800 bits per second or more, to transmit teletypewriter data at 110 to 1200 bits per second. The user pays for this inefficiency.

- *High data storage costs*—The costs associated with on-line storage of large data files at a remote computing center may rule out some applications that otherwise seem made to order for remote computing. It pays to shop around, since on-line mass storage prices vary considerably from vendor to vendor.

- *Loss of control*—The simplicity of interactive timesharing terminals sometimes leads to their use for problems that could more economically be handled by other means. As a result, the bill for remote computing services is likely to escalate beyond management's expectations. Therefore, it's important to establish and enforce proper control procedures. But controlling the access to and use of multiple terminals can be much more difficult than administering a centralized computer facility. It would help if the remote computing facility required users to identify themselves with a password and a department or project charge number.

SHOPPING FOR AN RCS VENDOR

Users seeking the services of a remote computing company have an enormous range of choices. Therefore, it's important to carefully examine the diverse offerings of the many vendors before choosing the very best service for a particular application. This process can be mind boggling, but the following information may make it easier.

The most important quality to consider when evaluating a time-sharing company is *service*. As we've discussed, today's remote computing company supplies much more than computing power; it is a service-oriented organization that provides the guidance necessary to get your applications up and running. The services available vary considerably from vendor to vendor, but may include training your staff, furnishing hardware, developing software, and providing other DP-related consulting or professional services in your specialty area.

Some of these value-added services are offered for an additional charge. But unlike consulting firms, for example, whose profit structure is based on their human resources and whose charges are based on hourly rates for the "people-time" the client uses, a good many RCS vendors simply write off at least some of the field services they perform as overhead against the day your application begins eating up connect time. In fact, the RCS vendor has a vested interest in providing a reasonable amount of timely, high-quality service for "free" to the end user. Such treatment promotes both faster cut-over to the RCS system and a healthy relationship with the customer, who then becomes a prospect for additional services.

Frequently, RCS companies provide equipment that is designed or programmed for use with specific applications packages as a turnkey system. Financial arrangements for these on-site systems vary greatly, but most are available for purchase or lease by the customer.

As mentioned, RCS vendors also provide applications software products that can be used on the remote computing system and then moved to the customer's in-house system on a licensed basis. This arrangement suits both the customer and the vendor. The customer can try out the software product for a few months or a year before buying, and vendors use the arrangement as a selling point to prospective RCS customers, generate revenue through license fees when the switch-over occurs, and retain the customer as an active prospect for additional services. As mentioned, many RCS vendors are successfully selling their software and have created markets independent of their RCS businesses by offering separate packages aimed directly at software customers.

Narrowing Your Search

In most metropolitan areas of the United States and Canada, prospective remote computing users can choose from dozens of suppliers. Selecting the company that will provide you with the most effective service at the lowest overall cost is not easy, but it is possible. What's needed is a straightforward, logical selection process that will guide you around the pitfalls which await the unwary. The following procedure, if judiciously applied, will virtually assure the satisfaction of your remote computing requirements in a reliable, economical manner.

1. *Define your requirements*—Before shopping for a remote computing service, it is essential to know what you want the service to do for you. Try to list all the reasonable applications for remote computing in your organization. Then rank these applications according to their relative importance and urgency. For each of the key applications, define the required computer functions—usually in terms of the inputs to be supplied, the calculations to be performed, the outputs to be produced, and their associated volumes. Specify the exact manner in which all computer inputs and outputs must interface with your existing procedures, forms, and/or data files, as well as any turnaround time requirements that must be met. Finally, determine the present overall cost of processing each application, so you will be in a position to know whether remote computing can really save you money.

2. *Survey the available remote computing services*—Find out which remote computing companies are actively marketing their services in your locality, and collect the basic information about their capabilities, specialities, and pric-

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ing. At the end of this report we describe, in comparison column format, more than 400 remote computing services companies. Also, RCS sales representatives customarily give brief presentations describing their firms' capabilities and provide brochures, price schedules, and sample contract forms.

3. *Choose the most likely candidates*—Now it's time to reduce the list of contenders to the three to six that seem best able to meet your requirements. You simply eliminate from consideration those suppliers that fail to measure up to one or more critical questions, including:

- Are the company's services available in your area at a competitive cost (including all communications and terminal costs)?
- Does the company offer the programming and technical support services you need?
- Does the company offer the specific programming languages and/or application programs you need?
- Does the company support the type of terminal equipment you need (or already own)?
- Can the company satisfy the requirements, if any, for compatibility with your existing programs and/or data files?
- Does the company seem able to meet your requirements for operational reliability and data security?
- Are you satisfied that the company is financially sound and in the business to stay?

4. *Learn all you can about each remaining candidate*—Now it's time to call in the sales representatives of each of the remaining contenders for in-depth discussions about their capabilities, services, and pricing. By now you will have a good idea what questions to ask them—and what answers you are looking for. Be sure to find out exactly what each company offers in the way of equipment configuration, program library, programming services, training, documentation, security measures, contract terms, etc. Get the details of each company's pricing structure, including possible "extra" charges for programming, training, manuals, application programs, and other products and services you may need. Be sure to ask for reference lists of current users. Contact these users, and learn all you can about what their experiences have been; it is likely to be a remarkably informative exercise.

5. *Make your selection*—By now, you have amassed a great deal of pertinent information. Now it's time to "put it all together." Calculate the estimated overall costs of satisfying all your remote computing needs with each supplier's services. Compare these costs with your present costs and (if appropriate) with the estimated costs of alternative approaches, such as a computer of your own or a conventional service bureau. In many cases, one of the remote computing suppliers will now stand out as a clear-cut choice. In other cases, it may pay to contract with two or more suppliers, and use the one whose offerings turn out to be the most economical for each of your applications.

If neither of the above solutions is appropriate, you may want to turn to some type of weighted point scoring system, in which each supplier is awarded an appropriate number of points for every desirable characteristic (such as availability, response time, languages, terminals, application programs, costs, etc.).

6. *Negotiate a suitable contract*—At this point, virtually every remote computing company will ask you to sign its standard contract form. But that is not necessarily your best move. There is a good chance the supplier will offer considerably better terms if needed to land your account. Read the contract carefully. Make sure it clearly defines the company's pricing structure, charges for all additional products and services, hours of service availability, length of commitment, termination provisions, etc. If the supplier writes any programs for you, make sure it is clear whose property they will be. If you are not completely satisfied with the standard contract terms, ask the supplier to amend them.

You will notice that most standard contracts disclaim any liability for damages arising either from the use of the suppliers' services or their failure to provide the agreed-upon services. If you feel you need more protection, such as guaranteed file security, ask for it. Discussions with other customers of the service may be especially helpful in this area, and the advice of your company's lawyer is worthwhile to ensure you will get the service and the protection you need.

7. *Make periodic reevaluations*—Once you've selected the best remote computing service for your needs, do not assume it will *continue* to represent your best choice. As a remote computing network becomes more heavily loaded, its performance tends to degrade. As the network's saturation point is approached, the response times to each user's requests are likely to increase. In addition to user frustration, this condition leads to longer connect times and higher costs. Therefore, reevaluate your service every few months. This will enable you to spot any deterioration in service and present your supplier with documentary evidence of the fact. If the supplier cannot assure you the original quality of service will soon be restored, remember that numerous other suppliers are eager for your business.

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▻ RCS TRENDS

The trend has been for major RCS vendors with extensive local access facilities and high-speed lines that interconnect them already in place, to view their telecommunications plants as assets for not only connecting their customers to the RCS data center, but also for connecting their customers to one another. Adding a value-added network offering is a relatively simple matter that requires minimal additional investment. Prominent value-added network offerings include those of IBM Information Network and CompuServe.

With so many value-added offerings now available through RCS vendors, we see ourselves closer to the time when data communications will be as common in the office and in the home as voice communications is today. Clearly, the future of the RCS industry lies in providing "super services," including microcomputer networks, robotics, and software and hardware communications solutions. In the near future, it's likely we'll witness many new developments in the RCS industry—developments that will continue to alter the definition of remote computing services.

REMOTE COMPUTING SUPPLIERS

Following this report, for your convenience in obtaining additional information, are comparison columns profiling more than 370 remote computing companies. The leading remote computing vendors are profiled separately following this report. ☐

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COMPANY PROFILES

Vendor Name	A/Tek Command	Access Innovations, Inc.	Accountants Computer Network, Inc.	Adams Engineering, Inc.
Address and Phone	6404 Castleway Court Indianapolis, IN 46250 (317) 842-3113	P.O. Box 40130 Albuquerque, NM 87196 (505) 265-3591	5650 South Brainard, Suite 102 La Grange, IL 60525 (312) 354-8988	4801 Woodway; Suite 260E Houston, TX 77056 (713) 961-1918
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11/70/44/23; facilities manager; maintenance company	Database producer	On-line computer service company; off-line computer service company; software vendor	On-line computer services company; software vendor selling software to be run on DEC, Gould SEL, and Honeywell systems; consulting
Applications emphasis	Accounting; education; government; medical and health care; payroll and personnel; sales and distribution	Data management and database management; engineering and scientific; government	Accounting; banking and finance; payroll and personnel; transportation	Engineering and scientific; petroleum
President	Richard W. Herron	Marjorie M. K. Hlava	Kenneth Kendrick	Neal J. Adams
Director of marketing	—	—	—	Betty K. Quay
Date founded	1967	1978	1977	1981
No. of employees	31; 25 percent devoted to on-line services	125	5; 100 percent devoted to on-line services	4
Rev. last FY	$1.0M-$4.9M; 20 percent from on-line services	$1.0M-$4.9M	—	—
Primary customers	CPA firms, dairy companies, credit and collection bureaus, utility companies, associations	Technical library and information centers; publishers; database producers	End users	Petroleum operators; drilling contractors; service companies
Product line	Offers timesharing and batch processing services through their data center at the Indianapolis location. Additional applications include time and billing and dairy. Offers lease/rental services for timesharing clients wishing to rent terminals, printers, etc. Also provides customized software.	A full-service information management company offering a variety of technical and professional services for database design and production; data entry and conversion; abstracting and indexing; technical writing and editing; and contract personnel.	Provides batch processing, conversion of programs, and on-line services for Prime and Honeywell computers. In addition, the company offers several vertical packages available for the florist and transportation industries. Computer System.	Develops software, supports a timesharing system, offers training, maintains an on-line database, and provides consulting for a number of petroleum companies and government agencies. A full line of drilling software is offered which includes programs addressing drilling engineering and drilling and completions morning report.

Vendor Name	ADP Autonet	ADP Network Services	Advanced Data Systems, Inc.	Advanced Medical Systems
Address and Phone	175 Jackson Plaza Ann Arbor, MI 48106 (313) 769-6800	175 Jackson Plaza Ann Arbor, MI 48106 (800) ADP DATA	4010 Long Beach Boulevard Long Beach, CA 90807 (213) 426-8155	36 Maple Avenue Rockville Centre, NY 11570 (516) 764-5953
Subsidiary of	Automatic Data Processing	Automatic Data Processing, Inc.	—	RVCM Group, Inc.
Principal business	On-line computer service company; data communications	On-line computer service company; database producer	On-line computer service company; off-line computer service company; facilities manager; consultants	On-line computer service company; software vendor, selling, software for use with Digital Equipment Corp. PDP-11 and VAX 11 Series
Applications emphasis	Data communications; telecommunications; packet switching; networking	Banking and finance; econometric forecasting; commodity exchange futures; interest rates; currency exchange rates; money supply and debt; financial planning; business and strategic planning; cross-tabulation analysis; graphics; financial and statistical time series	Accounting; medical and health care; payroll and personnel; sales and distribution; accounts payable; accounts receivable; general ledger	Medical and health care; patient registration and scheduling; blood bank management; medical records
President	—	Richard A. Patterson	Dennis Christy	Gerald Ehrlich
Director of marketing	—	Gerry Geist, VP. Marketing		Matthew Ehrlich
Date founded	—	1969	1970	1975
No. of employees	—	—	30	35; 50 percent devoted to on-line services
Rev. last FY	—	—	—	$6M
Primary customers	—	Banks, investment and accounting firms, money managers, custom house brokers	Accounting firms, manufacturers, restaurant & hotel industry	Hospitals, health care facilities
Product line	Offers a packet-switched data network to companies that want to connect to a public data network. Autonet offers direct toll-free access from more than 300 domestic locations and over 55 countries.	Provides on-line services for financial management, planning, investments, economics, and analysis. Features include: financial modeling and forecasting; fixed asset management; mergers and acquisitions analysis; portfolio analysis and optimization; and corporate analysis.	Provides batch and remote processing services. Available applications include accounts receivable, accounts payable, general ledger, sales analysis and forecasting, project costing, billing, and invoicing. Also provides wholesale and retail distribution, hotel management, and food service accounting for the medical and health service areas and custom software development.	Provides timesharing services for applications in the health care area. Available applications include admission, discharged, transfer; outpatient scheduling; medical records; personnel; hospital encumbrance; blood bank; surgical pathology; and laboratory pharmacy and materials management. Offers real-time processing for laboratory specialization systems. Turnkey packages also available.

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COMPANY PROFILES

Vendor Name	Allied Data	Altman Information Systems, Inc.	American Data Services, Inc.	American Library Association (ALANET)
Address and Phone	P.O. Box 2909 Olympia, WA 98507 (206) 456-3535	208 South LaSalle Street Chicago, IL 60604 (312) 443-1234	4550 S.W. Macadam Portland, OR 97201 (503) 224-9110	50 East Huron Street Chicago, IL 60611 (312) 944-6780
Subsidiary of	Division of U.S. Intelco Networks	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling, software for use with IBM PC	On-line computer service company; software vendor; maintenance company; equipment vendor—minicomputer/multiuser expandable microcomputers; other CP/M and CP/M-86 based systems	On-line computer service company	Educational association; on-line computer services company
Applications emphasis	Accounting; communications; forest products industry	Accounting; banking and finance; data management and database management; legal office accounting; investment analysis; business and strategic planning	Accounting; banking and finance; payroll and personnel; fixed assets; accounts payable	Library related information
President	Ken F. Parsons	Arthur P. Altman	E.O. Haymond, Jr.	Regina U. Minudri
Director of marketing	Bob Morse	—	—	Joel M. Lee
Date founded	1967	1980	1956	1876
No. of employees	80; 33 percent devoted to on-line services	12; 90 percent devoted to on-line services	145	275; 1.5 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 80 percent from on-line services	—	—	—
Primary customers	Telephone industry, forest products industry	Investment managers at banks and insurance companies, brokerage firms, law firms, and CPA firms	Financial institutions, associations, and networks	Libraries and librarians, library suppliers, publishers
Product line	Provides accounting, timesharing, batch processing and computer output microfiche services, and supplies. Also provides nationwide software and timesharing for the telephone industry. Timesharing and batch processing are offered for forest products applications in the Pacific Northwest. Also offers financial modeling.	Provides timesharing services. The company designs custom investment software for use in portfolio management, securities selection, and securities evaluations. Altman provides law office automation including legal time and billing, word processing, docket, litigation support and integrated accounting systems. The company also provides terminals, computer systems, software and peripherals.	Offers remote and batch processing. Available applications include combined deposits, installment, commercial, and mortgage loans; integrated general ledger, asset/liability reporting, fully integrated central information files, and on-line teller and telephone bill payment services. Other services include ATM driving via "strip" files or host-to-host connection, and complete card management services.	Produces ALANET, an electronic mail and information service. ALANET offers several electronic newsletters; interactive forms for library loans and communication with library suppliers; a system-wide bulletin board; electronic mail; and access to special databases. ALANET is a value-added reseller of Dialcom, Inc. products.

Vendor Name	American Management Systems, Inc.	Anacomp, Inc.	Analyste-Conseil Systeme Informatique (ACSI) LTEE	Applicon
Address and Phone	1777 N. Kent Street Arlington, VA 22209 (703) 841-6000	11550 N. Meridian Street, P.O. Box 40888 Indianapolis, IN 46240 (317) 844-9666	969, Route De L'Eglise Ste-Foy GIV 3V4, Canada (418) 653-1456	P.O. Box 986, 4251 Plymouth Road Ann Arbor, MI 48106 (313) 995-6000
Subsidiary of	—	—	—	Schlumberger Ltd.
Principal business	On-line computer service company; off-line computer service company; software vendor; facilities manager; systems integration; consultants; data center design; performance analysis and capacity planning	On-line computer service company; software vendor; facilities manager; maintenance company; consultants; micrographics services	On-line computer service company; off-line computer service company; facilities management; consultants	CAE/CAD/CAM system manufacturer
Applications emphasis	Accounting; banking and finance; data management and database management; government; legal; management sciences; mathematics and statistics; media; payroll and personnel	Banking and finance; transaction card systems	Accounting; data management and database management; engineering and scientific; government; mathematics and statistics; payroll and personnel; sales and distribution	Engineering and scientific; manufacturing
President	Charles O. Rossotti	Lewis P. Ferrero	Mariel Dessureault	Bruce McCann, Vice President General Manager
Director of marketing	Paul Renard	—	Jean DuPuis	Jerry Robertson, Vice-President, Marketing
Date founded	1970	1968	1976	1969
No. of employees	1,700; 15 percent devoted to on-line services	2,500; 10 percent devoted to on-line services	50; 30 percent devoted to on-line services	1,200
Rev. last FY	—	$172M; 50 percent from on-line services	$1.0M-$44.9M; 90 percent from on-line services	$50M or more
Primary customers	Research and consulting firms	Banks, credit unions, state and local government agencies, manufacturers, distributors	End users	Manufacturing industry
Product line	Provides interactive and batch processing service through data centers in Arlington, VA. Packages offered include database management, financial planning, information retrieval, simulation, statistical analysis, and text editing. Services include timesharing, application design, development, operations, microfilming (COM), and computer output to paper.	Provides support systems and micrographics services for large computer users coast-to-coast and on-line transaction processing for credit unions.	ASCI is a service bureau offering a wide range of computing facilities including timesharing, on-line and batch processing, custom system design, and programming, packaged software, data entry, etc. Areas of specialization include APL, statistical services, commercial applications, and CAO applications.	CAD/CAM/CAE systems for a variety of mechanical engineering and manufacturing applications, including: mechanical and electronics design, analysis, drafting, documentation, NC programming, facility layout, tool design, process planning, and fabrication. These workstations extend electronic communication to the factory floor within a manufacturer's existing environment.

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COMPANY PROFILES

Vendor Name	Applied Computer Enterprises	Aries Information Systems, Inc.	ArKos Associates	ASA, Inc.
Address and Phone	156 William Street New York, NY 10038 (212) 962-4037	7400 Metro Boulevard Suite 185 Minneapolis, MN 55435 (612) 835-2366	P.O. Box 354 Idaho Springs, CO 80452 (303) 567-4238	#3 Speen Street, Pt. West Office Park Framingham, MA 01701 (617) 872-2700
Subsidiary of	Lloyd Bush	—	—	—
Principal business	On-line computer service company; computer system management; disaster recovery	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; software vendor; consultants	On-line computer service company; software vendor, selling, software for use with Digital Equipment Corp. VAX and PDP-11s; maintenance company
Applications emphasis	Banking and finance; financial modeling; securities	Accounting; education; government; payroll and personnel	Medical and health care	Accounting; manufacturing; sales and distribution; transportation; data collection/information management; label and bar coding
President	Lloyd A. Bush	Alex Laurins	Emil J. Nagy	Christopher J. Crane
Director of marketing	—	Curt Swanson	—	—
Date founded	1971	1972	1971	1969
No. of employees	25; 30 percent devoted to on-line services	22; 90 percent devoted to on-line services	47; 10 percent devoted to on-line services	40; 100 percent devoted to on-line services
Rev. last FY	—	—	$200K-$499K; 10 percent from on-line services	$1.0M-$4.9M
Primary customers	Financial institutions, insurance companies, cross-industry	Local governments; educational institutions	Hospitals, physician's offices, clinics	Manufacturers and distributors
Product line	Provides classical timesharing services, as well as financial analysis and proprietary services to the financial community.	Provides remote computing and batch processing services. Currently serving education and local governments in 23 states and 3 Canadian provinces. Additional applications include fixed asset accounting and real estate taxes.	Provides access to medical and health care applications in such areas as nursing, surgery, emergency patient classification, quality assurance, staffing, standards, scheduling, productivity and statistical reporting, and radiology microcosting. Also provides general business services such as accounting, management sciences, and data and database management for clients in the health care fields.	Provides in-house systems for general businesses to the New England area. ASA is a Digital Equipment Corp. distributor specializing in the sale and installation of Digital Equipment Corp. computers and software to distributors and manufacturers. Offers remote support capabilities to its users.

Vendor Name	ASA International Ltd.	ASK Computer Systems, Inc.	Aspen Systems Corp.	Auto Tell Services, Inc.
Address and Phone	10 Manor Parkway Salem, NH 03079 (603) 898-7000	730 Distel Drive Los Altos, CA 94022 (415) 969-4442	1600 Research Boulevard Rockville, MD 20850 (301) 251-5000	600 Clark Avenue, P.O. Box 1350 King of Prussia, PA 19406 (215) 768-0200
Subsidiary of	—	—	Wolters Samsom U.S. Corp.	—
Principal business	On-line computer service company	On-line computer service company; software vendor, selling, software for use with Hewlett-Packard 3000 and Digital Equipment—VAX	On-line computer service company; database producer; information management; database publishing	On-line computer service company; computer system manufacturer; maintenance company
Applications emphasis	International trade	Accounting; manufacturing; graphics	Data management and database management; government; legal; management sciences	Accounting; data communications; payroll and personnel; inventory control
President	Christopher Crane	Ronald R. Braniff	Albert Lampert	Richard Schwenk
Director of marketing	—	David Sohm	Melvyn Goldenberg, Eugene Brannock—Unit Managers	Larry Sobiski
Date founded	1976	1971	1959	1967
No. of employees	95	480; 10 percent devoted to on-line services	460; 60 percent devoted to on-line services	115
Rev. last FY	—	$79M; 5 percent from on-line services	$20M-$50M; 90 percent from on-line services	$10M-$19M
Primary customers	Custom house brokers, international freight forwarders	End users, manufacturing companies	End users, law firms, publishers, information providers, corporations, government	Automobile and truck dealers, leasing companies, industrial plants, hospitals
Product line	Supplies computer services to customs brokers and freight forwarders. ASA systems produce required import and export documentation, billing, accounts receivable and payable, payments verification, and general ledger. Other capabilities include ABI, Telex, data communications, tracing liquidations, missing documents, landed cost, warehousing, and TSUSA maintenance.	Provides on-line remote processing for the ASK MANMAN Information System, which includes manufacturing management, order management and accounts receivable, accounts payable, fixed assets, payroll, project management, bar coding, field service management, repetitive manufacturing, human resources, and general ledger.	Provides litigation file management and other database services to the legal marketplace. Aspen is a full service vendor offering such services as the acquisition, processing, management, and retrieval of documents. The company has its own on-line network, Aspenet. Services include system design, technology integration, and database development.	Provides turnkey systems, and on-line and remote batch processing for accounting and parts inventory control. Services include: general ledger, financial statements, journal summaries, management reports, inventory reports, finance, insurance, service merchandising, and service dispatching. The in-house computer system is programmed and maintained for dealership applications.

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COMPANY PROFILES

Vendor Name	Automated Information, Inc.	Automated Medical Systems, Inc.	Automatic Data Processing, Inc. (ADP)	Automation, Inc.
Address and Phone	6710 Clayton Road St. Louis, MO 63117 (314) 644-4050	841 Chestnut Street, Suite 1310 Philadelphia, PA 19107 (215) 923-1010	One ADP Boulevard Roseland, NJ 07068 (201) 994-5000	10703 J Street Omaha, NE 68127 (402) 339-9500
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor; computer system manufacturer; Digital Computer distributor and Century Data Systems distributor	On-line computer service company; turnkey computer service company; consultant to health care professionals	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; electronic publishing
Applications emphasis	Accounting; legal; management sciences; manufacturing; payroll and personnel; sales and distribution; transportation	Medical and health care; medical billing procedures; medical office accounting	Accounting; banking and finance; data communications; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; automotive	Accounting; payroll and personnel; order processing; inventory control; accounts receivable; accounts payable; financial reporting; cost accounting; sales analysis; billing/invoicing/collection
President	Robert Love	G. William Carlson	Josh S. Weston	Michael Gregory, Vice-President and General Manager
Director of marketing	Anthony Ruggeri	John A. Quatrini	—	—
Date founded	1969	1977	1949	1957
No. of employees	120; 30 percent devoted to on-line services	50; 80 percent devoted to on-line services	16,000	40; 15 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 70 percent from on-line services	$1.0M-$4.9M; 80 percent from on-line services	$750M or more; 100 percent from on-line services	$1.0M-$4.9M; 65 percent from on-line services
Primary customers	Small to large business companies & organizations	Health care professionals; all specialties; hospital and private practices.	Cross-industry	Cross-businesses
Product line	Provides timesharing, batch processing, word processing, data entry, systems design, feasibility studies, programming, and turnkey systems. Services range from general ledger accounting to modeling and forecasting.	Provides billing/practice management services to health care professionals and outpatient clinics. Medical consultant developed system has flexibility to handle demands ranging from solo practitioners to largest clinics. Latest TEFRA and DRG requirements are accommodated. AMS provides cost-effective batch services, as well as on-line systems.	Provides computing services primarily through computer centers. The services are offered via batch and on-line processing, and on-site installations. The Commercial Services Group offers batch, on-line, and on-site employer services, accounting services, and services that are designed for use by manufacturers. The Brokerage Processing Group provides front- and back-office processing.	Provides batch and timesharing accounting applications. The packages are order entry; invoicing; inventory; accounts receivable; accounts payable; financial reporting; sales analysis; payroll; job costs; municipal financial services; Fleetfax—a transportation management system; and electronic publishing. The company also provides custom programming for business applications.

Vendor Name	AYA Associates, Inc. (AAI)	Aztech Corp.	B-H Computer Systems, Inc.	The Babcock & Wilcox Company
Address and Phone	275-277 Forest Avenue Paramus, NJ 07652 (201) 967-0770	1621 Connecticut Avenue, N.W. Washington, DC 20009 (202) 232-5500	14 S. Belmont Street York, PA 17405 (717) 843-0926	3315 Old Forest Road, P.O. Box 10935 Lynchburg, VA 24506-0935 (804) 385-2000
Subsidiary of	—	—	Pace Resources, Inc.	McDermott, Inc.
Principal business	On-line computer service company; mini/micro computer software/hardware integrator; software vendor, selling software for use with IBM System/36 series; NEC ASTRA minicomputer; Texas Instruments terminals; IBM PC; NEC APC; Altos	On-line computer service company	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 360/433; facilities manager; utility billing	On-line computer service company; software vendor, selling primarily engineering and scientific software especially for electric power utilities
Applications emphasis	Banking and finance; data communications; data management and database management; government; media; medical and health care; retail industry information	Accounting; fund raising; file management; mailing list generator; word processing; subscription fulfillment	Accounting; data communications; engineering and scientific; manufacturing; medical and health care; payroll and personnel; sales and distribution; utility management	Engineering and scientific; mathematics and statistics; structural engineering; nuclear engineering; civil engineering; graphics
President	Edgar H. Aya	John W. Rollins, Jr.	Robert E. Horn, Vice President	Dr. C.W. Pryor
Director of marketing	Leonard Bernstein	W. Douglas Fisher	—	J.J. Bird
Date founded	—	1968	1970	1971
No. of employees	23; 20 percent devoted to on-line services	40; 20 percent devoted to on-line services	25; 60 percent devoted to on-line services	1,200; 5 percent devoted to on-line services
Rev. last FY	$1.0M-4.9M; 90 percent from on-line services	$1.0M-$4.9M; 40 percent from on-line services	—	$5.0M-$9.9M; 98 percent from on-line services
Primary customers	Software companies, publishing companies, banks, retail chain stores, ceramic tile chains	Membership groups, associations, societies, fund raisers, publishers	Distributors, nursing homes, cities & boroughs, manufacturers	Electric utilities, technical consultants, manufacturers, architect-engineers, engineering consultants
Product line	Provides timesharing and on-line communications support. Other services include: resource management; minicomputer sales; minicomputer installation, support, and customized system development; contract programming; and management consulting as it relates to computer systems and procedures.	Provides computer service and turnkey computer systems. Primary applications include membership, mailing list, accounting, word processing, conference registration, and subscription fulfillment. The company's service bureau uses Data General equipment for on-line, interactive processing. IBM and Nixdorf equipment is used for batch and on-line transaction processing.	Offers batch and on-line services for accounting applications as well as local government applications such as sewer and water billing. Also distributes two lines of turnkey minicomputer systems. Provides standard packages and modifications to standard or custom packages.	Provides timesharing and remote batch computer service for nuclear analysis; nuclear fuel management and analysis; structural and piping analysis; fluids and thermal-hydraulics analysis; statistics; mathematics; and graphics. Other services include engineering and scientific applications software, technical software development, and software verification and validation.

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COMPANY PROFILES

Vendor Name	Barter Worldwide, Inc.	Batsch Spectracomp	BMA Data Processing, Inc.	Boeing Computer Services Company
Address and Phone	6033 W. Century Blvd. 4th fl. Los Angeles, CA 90045 (213) 641-1000; Telex 466807	5170 E. Trindle Road Mechanicsburg, PA 17055 (717) 697-8600	1174 East 2700 South Salt Lake City, UT 84106 (801) 487-8991	7980 Boeing Court Vienna, VA 22180 (703) 821-6505
Subsidiary of	—	—	Central Bank & Trust	A division of Boeing Company
Principal business	On-line computer service company; database producer; barter brokerage	On-line computer service company; database typesetting	On-line computer service company	Systems integration; telecommunications systems; interactive and remote computing; software vendor; consultants (systems engineering)
Applications emphasis	Accounting; banking and finance; data communications; engineering and scientific; insurance; legal; management sciences; media; medical and health care; payroll and personnel; facility design and management	Typesetting	Accounting; banking and finance	Government; manufacturing; energy; engineering and scientific; mathematics and statistics; data management and database management; sales and distribution; graphics; utility management; econometric forecasting; environment; structural engineering
President	Mike Jeffries	Terry E. Fackler	Paul W. Evans	—
Director of marketing	—	—	J. Wayne Webb	—
Date founded	1980	1964	1955	1970
No. of employees	—	25; 50 percent devoted to on-line services	81; 100 percent devoted to on-line services	10,000
Rev. last FY	—	$500K-$999K; 50 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services	—
Primary customers	Fortune 1000 Corporations	End users requiring typesetting from an existing database.	End users	Government, manufacturing companies, energy related companies
Product line	Operates the International Business Clearinghouse (IBC) on-line service. This is designed to arrange and expedite worldwide selling, buying, or exchanging transactions. IBC provides potential traders with daily information on goods/services up for sale or exchange, and includes electronic mail and telex services for transferring documents, contracts, and specifications of the sale.	Provides typesetting to the printing and publishing trade, colleges, governmental agencies, and the private sector. Receives data from the customer and translates it through interface with the Batsch Spectrocomp database for phototypesetting. The phototypesetting commands automatically generate into the file and output to digitized phototypesetting equipment.	Provides standard programs for banking and finance and all major accounting applications. BMA features a fully integrated accounting system with all applications posting automatically to the general ledger. The system is on-line, real-time with a one-time handling of the source document. The sales concentration is mainly in the western states.	Provides a full range of information services. Boeing Computer Services Company also provides systems development; facilities management; professional services; education and training; and communications network design and management.

Vendor Name	Bonner & Moore Computing Company	Bowne Information Systems, Inc.	Bradford National Computer Services, Inc.	Brant Computer Services Ltd.
Address and Phone	2727 Allen Parkway Houston, TX 77019 (713) 522-6800	400 Oser Avenue Hauppauge, NY 11788 (516) 231-0333	1500 Palisade Avenue Teaneck, NJ 07666 (201) 833-1020	615 Brant Street Burlington, Ontario L7R 2G6, Canada (416) 632-1386
Subsidiary of	Bonner & Moore Associates	—	Bradford National Corp.	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 4300/370/30XX; Data General Eclipse MV/800, MV/10000; facilities manager; laser printing; consultants	On-line computer service company	On-line computer service company; off-line computer service company; facilities manager; consultants	On-line computer service company
Applications emphasis	Accounting; manufacturing; sales and distribution; inventory control; oil and gas accounting procedures; electronics	Engineering and scientific; government; legal; construction; word processing; mailing list generator; records management	Accounting; banking and finance; data communications	Accounting; data communications; data management and database management; education; government; legal; manufacturing; sales and distribution; facility design and management; inventory control; order processing; job cost accounting
President	Jim C. Green	Robert K. Galuin	David G. Williams	Bruce C. Lyons
Director of marketing	Dick Stuart	Robert A. Cohn	Vincent J. Iuzzolino, Director of Sales	Bob Mutch
Date founded	1957	1969	1972	1969
No. of employees	100; 30 percent devoted to on-line services	100; 85 percent devoted to on-line services	145; 100 percent devoted to on-line services	55
Rev. last FY	$5.0M-$9.9M; 50 percent from on-line services	$10M-$19M; 50 percent from on-line services	$7.0M-$12M; 100 percent from on-line services	$3M
Primary customers	Cross-industry	Data processing managers, construction specifiers, attorneys, corporate end users	End users	Mid-size manufacturing companies; government agencies; distributors
Product line	Provides timesharing services accessing a software library of over 200 proprietary applications. The applications include oil and gas accounting, linear programming, inventory control, general financial packages, and electronic publishing. The software packages are also available for in-house use.	Provides on-line text processing and maintains SPECTEXT, the master specification from the Construction Specifications Research Foundation (CSRF) on magnetic media for over 160 microcomputers and word processing systems. The company also provides database typesetting, database printing, and demand printing.	Provides a nationwide data communications network of leased and dial-up lines which support interactive and remote job entry (RJE) traffic. Primary services include timesharing, systems, and development to be run on the host computer or remotely at a client's site. Conversions, system generations, and disaster backup services are also offered.	A Canadian-owned computer utility company providing a shared source of power accessed through the public telephone systems. By utilizing this timesharing environment, businesses can have the power and capabilities of Brant's Hewlett-Packard HP3000 computers without initial capital outlay or on-going overhead costs. Brant also distributes software packages, including Powerhouse and DollarFlow.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Broker Services, Inc.	Bunker Ramo Information Systems	Burns Computing Services, Inc.	Business Applications Group
Address and Phone	5950 S Willow Drive, #206 Englewood, CO 80111 (303) 779-8930	35 Nutmeg Drive Trumbull, CT 06609 (203) 386-2818	10 Gould Center, Suite 722 Rolling Meadows, IL 60008 (312) 981-5260	9619 Chesapeake Drive, Suite 105 San Diego, CA 92123 (619) 560-6343
Subsidiary of	—	—	—	
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; database producer; bank branch automation supplier	On-line computer services company	On-line computer service company; off-line computer service company; consultants
Applications emphasis	Accounting; banking and finance; payroll and personnel; securities; investment analysis	Banking and finance; commodities; securities; stock information; investment management; investment analysis	Accounting; sales and distribution; data management and database management; manufacturing; payroll and personnel; materials management	Accounting; job cost accounting; labor force information; retail industry information
President	James Donahue	Robert Amman	Frank J. Burns	Del Hickman
Director of marketing	James Donahue	Michael Cooper, V.P.	William Helzing	Jim Clark
Date founded	1976	1929	1983	1974
No. of employees	4; 75 percent devoted to on-line services	1,200; 100 percent devoted to on-line services	40; 100 percent devoted to on-line services	8
Rev. last FY	—	$50M or more	$5.0M-$9.9M	—
Primary customers	National security dealers	Brokerage firms; commercial banks; thrift institutions	Manufacturing companies	Financial, insurance, manufacturing, retail, construction industries
Product line	Provides on-line timesharing for financial stock market analysis and investment analysis. Also provides accounting and payroll applications. Users access the information via printer terminals through the Telenet communications network.	A supplier of on-line, real-time computer and branch automation systems and services for use in banks, thrift institutions and brokerage firms. The ALADDIN bank branch automation system provides comprehensive, on-line transaction processing capabilities for teller and administrative functions. Financial and stock quotation information is supplied to customers via Bunker Ramo's nationwide network.	Provides IBM mainframe services under MVS, DOS/VSE and VM to remote users. Software includes Millennium Financial systems and NOMAD2 Fourth Generation language.	Provides timesharing; remote and batch processing; and data entry services. Available applications include sales analysis and forecasting, labor distribution, project costing, time reporting, inventory control, product costing, property management, bill of material processing, accounts receivable, accounts payable, and general ledger. Offers custom software development.

Vendor Name	Business Information Systems, Inc.	Business Systems, Inc.	Call Computer	Canada Systems Group
Address and Phone	5128 N. Elston Avenue Chicago, IL 60630 (312) 685-7130	9845 W. Roosevelt Road Westchester, IL 60153 (312) 681-6060	1961 Old Middlefield Way Mountain View, CA 94043 (415) 964-5331	955 Green Valley Crest Ottawa K2C 3V4, Canada (613) 727-5445
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company	Off-line computer service company; REXON dealer; software vendor, software available for use with REXON family of microcomputers	On-line computer service company	On-line computer service company; industry-specific processing and professional services
Applications emphasis	Accounting; financial reporting; time accounting	Accounting; medical and health care	Computer related information	Accounting; banking and finance; data management and database management; engineering and scientific; insurance; management sciences; mathematics and statistics; sales and distribution; oil and gas exploration; financial planning
President	Albert C. Wagner	Clyde Scott	Alex Kamradt	John F. Ricketts
Director of marketing	Michael Cernauske	Bill Biggs	—	—
Date founded	1967	1971	1970	1971
No. of employees	27; 50 percent devoted to on-line services	100	10; 100 percent devoted to on-line services	1,500; 75 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	$1.0M-$4.9M	—	$50M or more; 80 percent from on-line services
Primary customers	Public accountants	Medical clinics, pharmacies, and cross-industry	Doctors, lawyers, end users	End users in industry, government and commercial environments
Product line	Provides a financial reporting system for public accounting firms. Offers flexible formats for financial statements, presentations, and interpretations. The company also provides a time accounting system for accountants, lawyers, architects, and similar professions. The services are available via remote computing and also through data transmission services.	Provides batch processing services. Applications are available for medical billing, accounting, and pharmacy prescription processing and accounting. The applications are also available for in-house systems. Business Systems, Inc. is also a distributor for Digital Techniques, Inc. and TOUCHCOM Computer Systems.	Provides timesharing services. Customers access the computer via telephone lines. The clients program their own applications into the Call Computer's system. Currently serving users in Mountain View and the surrounding area.	Provides interactive computing and remote batch processing. Industry-specific services include engineering applications, financial planning, management sciences, and engineering graphics to scientific and engineering clients; income tax processing to chartered accountants; and processing and administrative services to banking, brokerage, insurance, and investment clients.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Canton Automated Systems, Inc.	Cards, Inc.	Care Computer Systems	CCX Network, Inc.
Address and Phone	100 Central Plaza South, P.O. Box 110 Canton, OH 44701 (216) 489-3738	316 Main Street Elida, OH 45807 (419) 331-3060	P.O. Box 1408 Bellevue, WA 98009 (206) 451-8272	301 Industrial Blvd. Conway, AR 72032 (501) 329-6836
Subsidiary of	Citizens Savings Bank	—	—	—
Principal business	On-line computer service company; software vendor; facilities manager	On-line computer service company; off-line computer service company; software vendor, selling software for use with Data General Systems; computer system dealer for TeleVideo microcomputers; maintenance company; consultants	Off-line computer service company; software vendor, selling software for use with Datapoint Family of minicomputers, IBM PC XT and PC AT; maintenance company; distributed processing service	On-line service company
Applications emphasis	Accounting; banking and finance; data management and database management	—	Accounting; medical and health care	Direct mail; marketing
President	Larry Machan	Mark Kitson	—	R.P. Carter
Director of marketing	Ronald H. Arnold	—	—	Don W. Barrett, Jr.
Date founded	1965	1963	1969	1969
No. of employees	100	45	125	350
Rev. last FY	$1.0M-$4.9M	$1.0M-$4.9M	—	$10M-$19M
Primary customers	Thrift institutions, banks	Courts and county agencies	Small hospitals, nursing homes, long-term health care	Direct marketing companies
Product line	Provides complete real-time processing of all types of customer accounts; deposits; loans; EFT accounts; all completely integrated with general ledger accounting and customer information system. Optional services include menu-driven teller/platform system, marketing, CIF, and database extracts downloaded to customer's site.	Provides timesharing and batch processing services; large volume data entry services; plus computer sales, installation, custom and package programming, training, and support.	Provides shared processing, batch processing services, and turnkey products for accounting and patient management in the long-term health care industry. Features on-going support and new release (added enhancements) services.	Provides a computer-based, decision-support network and related data processing services to direct marketing organizations. These organizations use direct mail and telephones to reach consumers and businesses.

Vendor Name	Chemical Exchange Directory	ChemShare Corp.	CISI	Citicorp Electronic Securities Services
Address and Phone	Rue de la Gabelle, 9 CH-1227 Geneva, Switzerland (022) 42.20.70	P. O. Box 1885 Houston, TX 77001 (713) 627-8945	35 Boulevard Brune 75680 Paris, France (1) 4545-8000	641 Lexington Avenue, 7th Floor New York, NY 10043 (800) 241-2476
Subsidiary of	ADIA International	Texas-McCan	—	Citicorp
Principal business	On-line services company; database producer	On-line computer service company; database producer; software vendor, selling software for use with IBM, OS or DOS, ICL, CDC, DEC-VAX, Prime, Univac, and Micros	On-line computer service company; software vendor, microcomputer	On-line service company; database producer
Applications emphasis	Chemicals; chemistry related information; sales and distribution; marketing	Engineering and scientific; chemistry related information	Accounting; banking and finance; data management and database management; engineering and scientific; government; legal; management sciences; mathematics and statistics; payroll and personnel; sales and distribution; construction; real estate management	Banking and finance; insurance
President	Rainer Kettenacker, Managing Director	Dr. Michael McGuire	—	Edward J. Burchianti
Director of marketing	Dr. Douglas Mowat	Ken Lucas	—	Kenneth Cirillo
Date founded	1985	1969	1972	1984
No. of employees	4; 100 percent devoted to on-line services	25; 25 percent devoted to on-line services	3,000; 50 percent devoted to on-line services	100
Rev. last FY	—	$5.0M-$9.9M; 50 percent from on-line services	$50M or more	$50M or more
Primary customers	Chemical producers, chemical consumers	Oil, gas, chemical operating companies and engineering companies; pharmaceutical companies	—	Securities brokerages, pension fund managers, investment advisors
Product line	Serves the chemical and chemical-related industries. The primary service is intended to bring chemical buyers and sellers into contact on an international scale through on-line product information service. Supplier information is also offered as internal product catalogs. In addition, the company markets a consultancy service to the same industry. CED is staffed by chemical professionals.	Produces the Mixmaster database which contains over 10,000 sets of vapor-liquid equilibrium data for approximately 1,200 chemicals. ChemShare also develops the software for process simulation for calculating heat and material balances which is used in refineries, gas plants, chemical plants, and all the engineering construction firms supporting these operating companies.	Offers timesharing, remote batch and batch processing services. CISI sells and leases its own proprietary software and is converting many of its packages to run on microcomputers, either off-line or using data and programs downloaded from its central computer. CISI acquired UNI-COLL in 1980.	The company has developed a service called StreetSense that provides real-time market data, analysis, and other entry/inquiry capabilities to banking and brokerage, and personal investment clients.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Citicorp Information Resources	Cogito Data Systems, Inc.	Columbia Computing Services, Inc.	Combustion Engineering
Address and Phone	1080 Cherokee Denver, CO 80204 (303) 534-6622	90 Wall Street Princeton, NJ 08540 (609) 924-7200	8611 South 212th Street Kent, WA 98031 (206) 872-0283	1000 Prospect Hill Road Windsor, CT 06095 (203) 285-9194
Subsidiary of	Citicorp	—	Columbia Computing Services Ltd.	C-E Power Systems
Principal business	On-line computer service company; off-line computer service company; facilities manager	On-line computer service company; database producer; off-line computer service company; software vendor, selling software for use with Convergent Technologies.	On-line computer service company; software vendor	On-line services company; equipment supplier for energy related industries
Applications emphasis	Banking and finance	Education; transportation; petroleum; automotive	Education	Engineering and scientific; mathematics and statistics; transportation; energy; civil engineering
President	Rosemary Green, General Manager	Frank Gunther	Robert M. Delf	Charles E. Hugel
Director of marketing	Reed Myer	—	Robert M. Delf	William H. Wolfe
Date founded	1969	1968	1968	1912
No. of employees	157; 15 percent devoted to on-line services	210; 100 percent devoted to on-line services	30; 100 percent devoted to on-line services	30,000
Rev. last FY	\$5.0M-\$9.9M; 100 percent from on-line services	\$5.0M-\$9.9M; 100 percent from on-line services	\$1.0M-\$4.9M; 80 percent from on-line services	—
Primary customers	Commercial and industrial banks, savings and loans	Secondary schools; vehicle fleet management; fuel oil dealers	Public schools	Utilities and consultants
Product line	Provides on-line and batch processing services to banks and savings and loans in the Rocky Mountain area. Offers a customer information file and on-line inquiry, file maintenance, memo post and monetary post on all applications. Also provides on-line capabilities for remote proof operations.	Specializes in selected vertical markets, including secondary school administration, vehicle fleet maintenance, and fuel oil retailers. Delivery methods include on-line service, batch service, and turnkey super-micro systems. Marketing and support are done through subsidiaries and divisions: Petrodata; Cogito Corp.; Mainstem Corp.; and Automated Fleet Services.	Provides a fully integrated student and school record management system, comprising scheduling, mark reporting, attendance, academic history and transcripts, demographic data maintenance, general reporting, and various related applications. System supports on-line inquiry, on-line or batch update, and is available as a software product for installation on customers computers or via Columbia's service bureau.	Offers an on-line computer service that emphasizes applications in engineering, physics, and mathematics including statistics and probability risk assessment. The company's mainframe CDC and IBM computers are based in Windsor, CT and are accessible through TYMNET and local dial-up service. A software library of over 200 computer codes is available.

Vendor Name	Comcheq Services Ltd.	Commodity Communications Corp.	Commodity Information Services, Company (CISCO)	Communication Concepts, Inc.
Address and Phone	298 Garry Street Winnipeg, R3C 1H3, Canada (204) 947-9400	250 S. Wacker Drive, Suite 950 Chicago, IL 60606 (312) 977-9067	327 S. LaSalle Street, Suite 800 Chicago, IL 60604 (312) 922-3661	1044 Pulinski Drive Ivyland, PA 18974 (215) 672-6900
Subsidiary of	—	Oster Communications	—	—
Principal business	On-line computer service company; software vendor, selling software for use with Cyber mainframe and with the IBM PC	On-line services company	On-line computer service company; database producer; off-line computer service company; software vendor	On-line computer service company; remote, local and batch computer service company
Applications emphasis	Data communications; payroll and personnel	Commodities; stock information; investment reporting	Commodities; bonds	Accounting; banking and finance; government; insurance; sales and distribution; direct mail; facility design and management; advertising
President	John P. Loewen	Gene Dixon	Donald Jones	Lew T. Teffeau
Director of marketing	John Angus	Dominic DiVincenzo	Roger Lofstrand	Leo J. Hertzog, Jr., Exec. Vice President
Date founded	1968	1978	1967	1971
No. of employees	250; 10 percent devoted to on-line services	35; 50 percent devoted to on-line scvs.	8; 90 percent devoted to on-line services	250; 15 percent devoted to on-line services
Rev. last FY	\$10M-\$19M; 80 percent from on-line services	\$1.0M-\$4.9M; 100 percent derived from computer services	—	\$10M-\$19M; 30 percent from on-line services
Primary customers	All companies	Brokerage firms, private speculators, commercial/industrial customers	Banks, financial institutions, brokerage houses	End users, insurance, banking, publishing
Product line	Provides computerized payroll checks to any company for a monthly fee. The company can be any size from 1 employee to 10,000 employees. The company also has the service of remote data entry from a microcomputer or dumb terminal, called Micropay and Telpay for the usage of dumb terminals.	Provides video quotation services and software development services to brokerage firms, private speculators, financial institutions, agricultural concerns, and commercial firms. Market information is received and updated on a continuous basis via the company's private communications network.	Produces databases containing information on prices for all the commodities traded in the United States and London and cash treasury bonds. On-line and off-line access is available through the Telenet communications network. The data is updated continuously. Provides access to an analytical program library, which is also available for in-house use.	Provides a service bureau operation on a job shop or contract basis. Services include timesharing, remote job entry, data entry, direct mail services, contract programming, and high volume, laser and impact printing. Also provides package or facilities management and direct mail production.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	**COMNET Corp., Computer Network Division**	**Compu-Link Corp.**	**Compusearch Corp.**	**CompuServe, Inc.**
Address and Phone	5185 MacArthur Boulevard, NW Washington, DC 20016 (202) 537-2500	4000 N. Grand River Lansing, MI 48906 (517) 323-4134	7631 Leesburg Pike Falls Church, VA 22043 (703) 893-7200	5000 Arlington Centre Boulevard; P.O. Box 20212 Columbus, OH 43220 (614) 457-8600
Subsidiary of	—	—	—	H & R Block, Inc.
Principal business	On-line computer service company; off-line computer service company; software vendor; facilities manager	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 370/135; facilities manager	On-line computer services company; database producer	On-line computer service company; facilities manager
Applications emphasis	Data management and database management; education; engineering and scientific; government; mathematics and statistics; graphics	Accounting; banking and finance; data communications; data management and database management; government; insurance; legal; manufacturing; medical and health care; payroll and personnel; sales and distribution	Government; government documents and publications; government services	Banking and finance; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; graphics; financial planning; electronic mail; mining and mineral exploration
President	Gary M. Siegel	John LaRose	James W. Benson	Charles W. McCall
Director of marketing	Robert J. Gac		Julie Kalms	Terrance J. Aaron
Date founded	1967	1969	1985	1969
No. of employees	130; 90 percent devoted to on-line services	49	11; 80 percent devoted to on-line services	725; 100 percent devoted to on-line services
Rev. last FY	$14M; 70 percent from on-line services	—	—	Over $50M; 100 percent from on-line services
Primary customers	End users	Medical and health care facilities, mortgage loan companies	Contract administrators, research librarians, defense contractors, and attorneys	Major corporate customers, financial institutions, government agencies, and PC users
Product line	Provides timesharing and remote batch services via a nationwide telephone network. Systems include file editing capabilities, remote job entry capabilities, interactive processing, and text editing. Additional services include facilities management, consulting and professional services, graphics, and nonimpact laser printing. Also sells proprietary software and is a distributor for IBM compatible equipment.	Provides on-line and off-line computer services. The same applications are available for either on-line and batch processing. Packages are available for sale.	Provides on-line access to all Federal Procurement Regulations Federal Acquisition Regulation (FAR) databases. Compusearch provides the full text of the FAR and all FAR supplements (approximately 26 databases), including Department of Defense, NASA, Navy, HHS, and GSA. The databases are updated daily. The company gears its products to Fortune 1000 contract administrators.	Provides remote computing services. CompuServe's remote computing service is its oldest and most significant business unit. Applications are available for banking management services, financial planning and analysis, database management and reporting, management sciences, research and development, demographic analysis, graphics, engineering, and network and videotex communications.

Vendor Name	**CompuSource**	**Computer Accounting, Inc.**	**Computer Associates, Inc.**	**Computer Center, Inc.**
Address and Phone	110 MacKenan Drive Cary, NC 27511 (919) 469-3325	P.O. Box 1154 Tacoma, WA 98401 (206) 272-7350	1814 South Main Street South Bend, IN 46624 (219) 232-7921	423 West Monument Street Baltimore, MD 21201 (301) 728-3883
Subsidiary of	—	—	—	—
Principal business	Disaster recovery consulting; on-line computer services company; laser printing	On-line computer service company	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11 and IBM-PC compatibles; value-added reseller of PC systems and software	On-line computer service company; off-line computer service company
Applications emphasis	Consulting	Accounting; payroll and personnel	General ledger; accounts payable; accounts receivable; retail industry information; pharmaceutical industry information	Data management and database management; inventory control; medical billing procedures
President	Wayne Edge	David Morris	James A. Gross	Jerome Markman
Director of marketing	Don Smith	—		—
Date founded	1980	1971	1967	1956
No. of employees	Less than 100	10; 100 percent devoted to on-line services	8; 40 percent devoted to on-line services	40; 25 percent devoted to on-line services
Rev. last FY	$5.0M-$10M	$200K-$499K; 100 percent from on-line services	$500K-$999K; 30 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	End users	Travel agencies, building contractors, small business	End users	Physicians, automobile dealers
Product line	A disaster recovery and computing services firm catering to the needs of major organizations, data processing professionals, and end users. CompuSource is a multiproduct company offering disaster recovery, disaster recovery consulting, remote computing, and laser printing. Major emphasis is placed upon the disaster recovery and remote computing services.	Provides on-line, interactive, standard accounting and payroll packages. Each application has options for customization to individual client needs. Interface between applications is optionally available for validation and posting purposes. Reports requested by clients are printed either at the data center or in the clients' office. Users can access information via terminals. Formal training is provided.	Provides on-line timesharing services for accounting and pharmacy applications. The accounting system includes general applications; such as, accounts payable, accounts receivable, and general ledger. The pharmacy system includes prescriptions, label preparation, patient profiles, pharmacy inventories, accounts receivable, third-party billing, and year-to-date purchases per customer.	Provides timesharing and batch processing services. Applications include professional billing for physicians, inventory control and comparative analysis for commercial companies, and specialized areas. Also offers customized programming.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	The Computer Company	Computer Innovations	Computer Institute of America	Computer Resource Services, Inc.
Address and Phone	1905 Westmoreland Street Richmond, VA 23230 (804) 358-2171	55 E. Jackson, Suite 1515 Chicago, IL 60604 (312) 663-5930	465 Castro Street Mountain View, CA 94041 (415) 964-0413	770 East Sahara, Suite 301 Las Vegas, NV 89104 (702) 369-2800
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; distributed processing; dealer networks; turnkey systems	On-line computer service company	On-line computer service company
Applications emphasis	Accounting; banking and finance; data management and database management; transportation; aviation; petroleum	Accounting; banking and finance; data management and database management; engineering and scientific; legal; management sciences; mathematics and statistics; medical and health care; energy; text processing; food industry; retail industry information	Accounting; legal; manufacturing; medical and health care; billing/invoicing/collection; accounts receivable; accounts payable; inventory control	Accounting; banking and finance; data management and database management; education; sales and distribution; accounts payable; accounts receivable; general ledger; cost accounting; inventory control; order processing; hotel/motel management
President	Walter R. T. Witschey	Jean Franz	Dr. Jerry Seehof	Ben Johnson
Director of marketing	—	—	—	Bill Mays
Date founded	1968	1969	1970	1980
No. of employees	1100; 5 percent devoted to on-line services	20; 20 percent devoted to on-line services	15; 12 percent devoted to on-line services	25; 100 percent devoted to on-line services
Rev. last FY	$10M-$19M; 100 percent from on-line services	$1.0M-$4.9M; 20 percent from on-line services	$1.0M-$4.9M; 95 percent from on-line services	$500K-$999K; 100 percent from on-line services
Primary customers	Airlines, banks, utilities, transportation companies	End users, consultants, trade associations	Manufacturing companies, legal firms	—
Product line	Provides timesharing services for over 600 on-line applications programs. The division specializes in applications packages for airlines, banks, and utilities. Also offers access to databases. The sources of information for these databases include: Civil Aeronautics Board, Avonark, Inc., and National Archives and Record Services for the C.A.B. database and Ernest E. Blanche Consultants for INS.	Provides contract programming and software development for individual use or for use by a network. Customizes many existing on-line packages and application programs to suit users specific needs. Offers hybrid on-line microcomputer systems. Also includes local dial-up from all major cities.	Provides computer timesharing services or turnkey multiterminal systems. Operational systems include legal and professional data collecting, billing, and receivables; accounts payable; accounts receivable; generalized data file maintenance and retrieval; financial analysis; payroll; distributor inventory; and a text editor. All programs run in both modes and are completely compatible.	Provides general accounting and inventory management to complete business control. Includes payroll, accounts receivable, accounts payable, general ledger, time and cost accounting, inventory management, order entry invoicing, management reports, regression analysis, investment appraisal, wage, and tax statements.

Vendor Name	Computer Sciences Corp. (CSC)	Computer Sciences of Australia Pty. Ltd.	Computer Sports World, Inc.	Computer Task Group, Inc.
Address and Phone	650 North Sepulveda Boulevard El Segundo, CA 90245 (213) 615-0311	460 Pacific Highway St. Leonards, NSW 2065 Australia 02-439-0033	1005 Elm Street Boulder City, NV 89005 (702) 294-0191	800 Delaware Avenue Buffalo, NY 14209 (716) 882-8000
Subsidiary of	—	Computer Sciences Corp., El Sequndo, CA 90245	The Chronicle Publishing Company	—
Principal business	On-line computer service company; facilities manager; consultants	On-line computer service company; database producer; software vendor, selling software for use with Univac, IBM, Prime; consulting; systems engineering; specialized services for the mining and financial industries	On-line services company; database producer	On-line computer service company; consultants; off-line computer service company; custom software development; facilities manager; computer system manufacturer; conversions
Applications emphasis	Accounting; data communications; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; sales and distribution; petroleum;	Accounting; banking and finance; data management and database management; engineering and scientific; government; insurance; management sciences; mathematics and statistics; sales and distribution; transportation	Sports	Banking and finance; manufacturing; telecommunications; metals; utility management; aerospace; automotive; chemicals
President	William R. Hoover	R. H. Kassel	Dr. Robin Cobbey	John P. Courtney
Director of marketing	—	J. Pierce	Brian Rouff	—
Date founded	1959	1971	1983	1966
No. of employees	13,000; 25 percent devoted to on-line services	600; 25 percent devoted to on-line services	12; 100 percent devoted to on-line services	2,000+
Rev. last FY	$50M or more; 25 percent from on-line services	$20M-$50M; 50 percent from on-line services	—	$143M
Primary customers	End users	End users	—	End users
Product line	Provides computer services through its Information Network Services Group. Infonet, the international network service, is part of the group. Infonet network services include access to reference databases; financial, engineering, scientific, project management, simulation modeling, economic forecasting, mathematics, statistics, and graphics applications; and a variety of programming languages.	Supplier of computer services in Australia. The Network Services Division offers an information processing service which provides timesharing and remote-batch processing. The Systems Services Division undertakes large-scale support and development projects for government organizations, commerce, and industry in the areas of consulting, systems management, and project implementation.	Provides an elite database containing more than 3,000 files of sports and racing information, entitled Computer Sports World (CSW).	Designs, builds, implements, and maintains information and automation systems. The company also offers direct mail, conversion and documentation services, software development, remote computing, and batch processing services.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Computer-Time Corp.	Computers for Marketing Corp. (CFMC)	Comshare, Inc.	Comtech Group International Ltd.
Address and Phone	P.O. Box 485, 17591 Highway 8 Morrison, CO 80465 (303) 697-4750	547 Howard Street San Francisco, CA 94105 (415) 777-0470	3001 South State Street, P.O. Box 1588 Ann Arbor, MI 48106 (313) 994-4800; (800) 922-7979	5 Fairview Mall Drive, Suite 450 Willowdale M2J 2Z1, Canada (416) 492-1480
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11 Series; Prime 50 Series; facilities manager	On-line computer service company; service bureau for processing of market/research studies; software development and leasing at client-owned computer centers; communications/network development for selected companies	On-line computer service company; software vendor, selling software for use with mainframes and microcomputers in an IBM environment; consultants	On-line computer service company; off-line computer service company
Applications emphasis	Accounting; education; insurance; legal; payroll and personnel; sales and distribution; transportation; marketing; real estate management	Consumer and market research; advertising; marketing	Budget systems; forecasting; business and strategic planning; statistical analysis; graphics; computer related information	Accounting; payroll and personnel; sales and distribution
President	Jim Mayer	Leif Gjestland	Richard L. Crandall	Donald Gray
Director of marketing	—	—	Kevin O.N. Kalkhoven	Rod Dobson
Date founded	1970	1967	1966	1966
No. of employees	6; 100 percent devoted to on-line services	30	989	120; 40 percent devoted to on-line services
Rev. last FY	$500K-$999K; 100 percent from on-line services	—	$50M or more	$5.0M-$9.9M; 100 percent from on-line services
Primary customers	End users	Market research suppliers, advertising agencies, corporate market research departments	Fortune 1000 companies and major banks, telephone companies	End users
Product line	Applications include general ledger, accounts receivable, accounts payable, payroll, and inventory. Custom software is produced for customers on a charge basis. Dedicated multiplexed lines are provided for larger users. Client billing for professional services and tenant accounting for real property are specialty packages. Also available are file management and report generation software.	Provides complete line of integrated market/survey research software: key-to-disk device (MICROPUNCH) which replaces keypunch; CRT interviewing for telephone facilities (SURVENT) or intercept situations (MICROSURVENT); cross tabulation and data analysis software for beginner through expert; and statistical analysis software (STATPAK). Programs are available on a lease basis or on a timeshare basis.	Provides decision support products and services to provide solutions for business problems. Timesharing-based products include System W for business planning, Questor for information management, Tactics for data analysis, Orion for time-series analysis, Profiles Services for human resource management applications, and telecommunications software and service for telephone companies.	Provides batch and timesharing services for packaged application products. Timesharing applications include sales order processing, inventory reporting, accounts receivable, invoicing, sales analysis, financial planning, and word processing. Batch applications include payroll, general ledger, and accounts payable. All batch services can be set up with a timesharing front end for data entry.

Vendor Name	Concap Computing Systems	Concord Computing Corp.	Connections Telecommunications, Inc.	Construction Computer Control Corp.
Address and Phone	680 Hegenberger Road, Suite B2 Oakland, CA 94621-1921 (415) 635-5750	500 W. Cummings Park, Suite 3500 Woburn, MA 01801 (617) 933-8910	322 East Center Street West Bridgewater, MA 02379 (617) 584-8885	615 E. Michigan Street Milwaukee, WI 53202 (414) 278-0500; (800) 558-9018
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; consultants	On-line computer service company; electronic transactions; electronic authorization systems using Tandem computers; financial switch and settlement systems; facilities manager; application specific data entry terminals	On-line service company; software vendor	On-line computer service company
Applications emphasis	Accounting; engineering and scientific	Banking and finance; retail trade data; electronic funds transfer	Telecommunications; data communications	Accounting; payroll and personnel; job cost accounting; construction
President	Stewart Larson	Thomas Swithenbank	Gerald P. Ryan	William C. Koenig
Director of marketing	—	James Crane, Vice President, Sales	John C. Hotchkiss	—
Date founded	1965	1969	1980	1968
No. of employees	10; 30 percent devoted to on-line services	—	24	60; 100 percent devoted to on-line services
Rev. last FY	—	—	$1.0M-$4.9M	—
Primary customers	Civil engineering companies, land surveying companies, city and county public works departments	Commercial banks, supermarket chains	End users, data communications equipment vendors	Construction companies
Product line	Provides timesharing services for civil engineers, land surveyors, and structural engineers. Applications include: coordinate geometry, field survey stakeout and reductions, earthwork quantities, and frame and truss analysis. The coordinate geometry programs interface with graphics programs producing subdivision plots and grading plans. The programs are also available on in-house turnkey minicomputers.	Provides on-line services for check authorization at the retail level and financial applications for banking institutions. Clients can access their bank's computer or the Concord Computing data center. Also provides point-of-sale terminals, self-service banking terminals, and cash dispersement equipment.	Producers of the Online Telecommunications Information Service (O.T.I.S.). The service is an on-line reference and pricing resource for telecommunications tariff environments.	Provides timesharing and distributed processing (microcomputer/mainframe linking) services to construction contractors. Services include integrated payroll/labor cost control, accounts payable/receivable, cash flow and job cost analysis, subcontractor control, purchase order/committed cost control, historical job cost productivity analysis, capital equipment control, inventory control, and general ledger.

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COMPANY PROFILES

Vendor Name	The Continuum Company (TCC)	Control Data Corp.	Cooper Data Systems, Inc.	Cornell Computer Services
Address and Phone	3429 Executive Center Drive Austin, TX 78731 (512) 345-5700	8100 34th Avenue South, Box 0 Minneapolis, MN 55440 (612) 853-8100	636 Baronne Street New Orleans, LA 70113 (504) 581-7611	G02 Uris Hall, Cornell University Ithaca, NY 14853 (607) 256-4981
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; computer system manufacturer; maintenance company; consultants	On-line computer service company; off-line computer service company; software vendor, selling software for use with Control Data computers and those of other manufacturers; computer system manufacturer; maintenance company; consultants; financial services company	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM System/36; computer vendor selling IBM System/36 and PCs	On-line computer service company; off-line computer service company
Applications emphasis	Insurance; financial services	Accounting; banking and finance; data communications; data management and database management; education; engineering and scientific; government; legal; management sciences; manufacturing; mathematics and statistics; payroll and personnel; econometrics	Accounting; legal; construction; oil and gas exploration	Education
President	Ronald C. Carroll	Robert M. Price, CEO	William G. Barry	—
Director of marketing	Brian Mulconrey	Robert W. Duncan, Sr. V.P. Corporate	—	Greg Appling
Date founded	1968	1957	1945	1967
No. of employees	750	44,000	25	165; 50 percent devoted to on-line services
Rev. last FY	—	$50M or more	$1.0M-$4.9M	—
Primary customers	Insurance companies	End users and other manufacturers in business, industry, and government	End users	Cornell University, academic institutions
Product line	Provides full-function client management, contract administration and marketing software for life insurance companies. System includes new business processing, policy issue, billing and collection agency production and persistency, policy exhibit and valuation, and policyowner service. Remote processing services also available. Marketing systems include sales proposals and client information.	Provides interactive and batch processing services. Offers applications programming primarily in the scientific and engineering areas. Provides data and services through Business Information Services, a Control Data company, and communications services through Cybernet, Network Information Services. Offers maintenance through their engineering services division and also offers consulting.	Provides timesharing and services for law firm accounting. Applications available through batch processing include accounts receivable, accounts payable, payroll, general ledger, insurance, and time accounting.	Provides batch and interactive computer services for instruction or research applications. Offers statistical programming and econometric analysis through the Troll System and identification of chemical substances through Mass Spectral Analysis. Also licenses software enhancements to the VM operating system.

Vendor Name	Corporate Services, Inc.	CRC Information Systems, Inc.	Creative Socio-Medics, Inc.	Crowntek, Inc.
Address and Phone	3410 E. McDowell Road Mesa, AZ 85203 (602) 832-8230	435 Hudson Street New York, NY 10014 (212) 620-5678	16 East 32nd Street New York, NY 10016 (212) 696-3500	3000 Steeles Avenue East Markham, Ontario L3R 4T9 Canada (416) 493-0800
Subsidiary of	—	—	Advanced Computer Techniques Corp.	—
Principal business	On-line computer service company; software vendor, selling software for use with IBM 4300; maintenance company; consultants	On-line computer service company	On-line computer service company; software vendor; facilities manager; turnkey systems	On-line computer service company; software vendor; consultants; facilities management; enhanced communications services
Applications emphasis	Accounting; data communications; insurance; mathematics and statistics; payroll and personnel	Consumer and market research	Accounting; medical and health care; mental health information; pharmaceutical industry information; humanities	Data processing; accounting; payroll and personnel
President	Don R. Horrocks	Jeffery A. Starr	Jerry Koop	Edward P. Cannon, Vice-President
Director of marketing	Don R. Horrocks	—	Richard Hourahan	—
Date founded	1972	1975	1968	1983
No. of employees	6; 50 percent devoted to on-line services	75; 100 percent devoted to on-line services	90	1,500
Rev. last FY	$200K-$499K; 90 percent from on-line services	—	$1.0M-$4.9M	—
Primary customers	Insurance companies, accountants	Fortune 500 companies, market research companies, advertising agencies	End users in medical/health care marketplace	Commercial business, government, financial, and public organizations
Product line	Provides international timesharing services for general business applications, sales aids, qualified pension, actuarial, and profit-sharing plans, using the APL programming language. Programming can be done by the user. Also provides custom programming for specific applications, tele-mail, and word processing.	Provides on-line timesharing. Applications are available for market research data processing and multivariate statistical work.	Provides timesharing services, batch information processing, and integrated minicomputer systems. Provides health care management information systems and services for a variety of health care settings including: outpatient clinics, mental health and psychiatric facilities, corporate medical departments, and hospital based ambulatory care facilities. Also provides consulting and technical assistance services.	The company's main products include Shared Processing, a remote interactive and batch processing service that is an alternative to in-house computing; Dedicated Processing, a data center management service; Prod/Net, an office automation service; and Streamline, an enhanced communications service. Also offers mainframe database management systems and applications development services.

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COMPANY PROFILES

Vendor Name	CTS Services, Inc.	Cuna Data/Norfolk	Custom Computer Services, Inc.	Cybershare Ltd.
Address and Phone	2720 Stemmons Freeway, Suite 805 Dallas, TX 75207 (214) 637-3344	888 Norfolk Square Norfolk, VA 23502 (804) 857-0681	2210 San Joaquin Fresno, CA 93721 (209) 486-4750	550 Berry Street Winnipeg, Manitoba, Canada R3H OR9
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; software vendor	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. products; BTI 5000/8000; facilities manager; computer system manufacturer; maintenance company	On-line computer services company; off-line computer services company; software vendor; facilities manager
Applications emphasis	Accounting; banking and finance; data management and database management; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution; transportation; energy	Accounting; credit union accounting	Accounting; agriculture	Accounting; education; engineering and scientific; government; legal; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution
President	Carlton E. Wade	David Jackson, Account Manager	John Dodson	Jack Turner
Director of marketing	D. Michael Cannady	—	—	Jack Turner
Date founded	1980	1964	1970	—
No. of employees	15; 100 percent devoted to on-line services	48; 80 percent devoted to on-line services	50; 50 percent devoted to on-line services	102; 100 percent devoted to on-line services
Rev. last FY	$500K-$999K; 100 percent from on-line services	$200K-$499K; 85 percent from on-line services	$1.0M-$4.9M; 90 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	End users	Credit unions, banks	Cross-industry	—
Product line	Provides on-line services out of two divisions. The "500" Division provides management timesharing and specialized software development on large scale computers operating under the Dartmouth Timesharing System (DTSS). Small Business Division provides timesharing on minicomputers operating under the Pick Operating System with access via local telephone into the customer's private port on a machine.	Provides interactive and batch processing services for all types of account processing for credit unions. Available credit union applications include shared accounts, shared/draft accounts, loans, Certificates of Deposit, and stock ledger. Currently serving the Mid-Atlantic states (Maryland, Virginia, North Carolina, South Carolina, Georgia, and Washington, DC).	Offers timesharing and batch processing services for general business and agricultural application. The timesharing service is available with the ability to migrate to a complete in-house system using identical software. Also provides custom programming.	A service utility offering timesharing services in the fields of education, and science and engineering. Other services include financial planning, and on-line management information systems such as A/R and inventory control. The company's software will run on Control Data's Cyber 170/174 and Honeywell's 66/440.

Vendor Name	Cybertek Computer Products, Inc.	Cycare System, Inc.	D & B Computing Services, Inc.	Data Line Service Company
Address and Phone	6133 Bristol Parkway Culver City, CA 90230 (213) 649-2450	4343 E. Camelback Road Phoenix, AZ 85018 (602) 952-5300	187 Danbury Road Wilton, CT 06897 (203) 762-2511	885 S. Village Oaks Drive Covina, CA 91724 (818) 339-9011
Subsidiary of	—	—	The Dun & Bradstreet Corp.	Coast Savings and Loan Association and Pacific Savings Bank
Principal business	On-line computer service company; database producer; off-line computer service company; facilities manager; office automation systems	On-line health care computer service company	On-line computer service company; software vendor, selling software for use with IBM 4300, IBM 370 Series or Plug Compatible; facilities manager; consulting and programming	On-line data processing service company
Applications emphasis	Insurance	Patient treatment; patient accounting; financial services; medical and health care	Accounting; banking and finance; data management and database management; education; engineering and scientific; management sciences; mathematics and statistics; demographics	Banking and finance; data management and database management
President	Vaughn W. Morgan	James D. Dyer	David S. Fehr	Norman Salveson
Director of marketing	—	Curt Barker, V.P.	Andrew X. Abraham, Vice President	—
Date founded	1969	1968	1967	1966
No. of employees	250; 25 percent devoted to on-line services	1,000; 88 percent devoted to on-line services	600; 50 percent devoted to on-line services	Over 226; 80 percent devoted to on-line services
Rev. last FY	—	$50M or more	$50M or more; 66 percent from on-line services	$10.0M-$19.9M; 100 percent from on-line services
Primary customers	Life insurance companies	Hospitals, physicians, medical groups, Health Maintenance Organizations, distribution services	End users, information center managers	Savings and loan associations; end users
Product line	Provides on-line and batch processing services for life insurance applications. Five on-line applications and nine batch applications are provided on a service arrangement. A letter writing system is available that accesses the Cybertek service bureau. The service bureau offers timesharing services with standard operating systems, on-line programs, and HASP/RJE batch processing.	Provides timesharing, software system and service, and remote processing services. Applications available in the medical area.	Specializes in on-line computing, custom software design, and the sale of proprietary software for in-house use. Users of the on-line service have access to programs running under the company's proprietary VP/CSS operating system. NOMAD2 is a comprehensive, generalized DBMS that utilizes a fourth generation language to provide database functions, reporting, and financial analysis.	Offers on-line, real-time data processing for the savings and loan industry. Applications include savings, loans, collections, general ledger and EFT as well as cooperative data processing. Data is instantly accessible through teller and/or administrative terminals. Other products include mortgage banking, secondary marketing, investor reporting and expanded EFT network services.

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COMPANY PROFILES

Vendor Name	Data Processing Center, Inc.	Data Processing Enterprises	Data Technology, Inc.	Dataline, Inc.
Address and Phone	3920 Howard Avenue New Orleans, LA 70125 (504) 821-6165	914 South Hoover Street Los Angeles, CA 90006 (213) 380-7200	2200 South George Street York, PA 17403 (717) 741-4821	67 Richmond Street West Toronto, M5H 1Z5, Canada (416) 365-1616
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 4330; Datapoint Arc System	On-line computer service company	On-line computer service company; software vendor; maintenance company; consultants; computer system integrators	On-line computer service company
Applications emphasis	Accounting; payroll and personnel; inventory control; accounts receivable; accounts payable; royalty accounting; telephone industry services	Accounting; sales and distribution; inventory control; accounts receivable; purchasing management	Accounting; education; label and bar coding; political science; inventory control; data collection/information management	Banking and finance; stock information; investment management; data management and database management; government; social sciences; financial modeling; securities; petroleum
President	John D. Pepperman	Murray Chesis	Clyde R. Snyder	Joseph C. Paradi
Director of marketing	Maurice J. Manix	Aaron Rosen	Roger P. Calabretta	B.D. Woloshyn
Date founded	1960	1966	1980	1968
No. of employees	35; 10 percent devoted to on-line services	90; 40 percent devoted to on-line services	8	135; 100 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 20 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services	$1.0M-$4.9M	$20.8M; 100 percent from on-line services
Primary customers	Cross-industry	End users	Manufacturers, educational institutions, distributors, wholesalers	End users
Product line	Provides timesharing and batch processing services. Available applications include general ledger, accounts receivable, accounts payable, statements, oil and royalty accounting, route distribution, and telephone call analysis. The software packages are available for lease or sale.	Provides interactive on-line services for order entry, invoicing, and back order control. Systems are also available for inventory control, accounts receivable, and purchasing. Data Processing Enterprises currently serves the Southern California area.	Offers on-line timesharing with an emphasis on educational financial applications and student accounting applications. Provides turnkey label and bar code systems, incorporating scanners, scales, label applications, etc.	Provides full service solutions in: Stock Brokerage—the Canquote division offers a complete line of stock, commodity, futures, options, and a financial news information system in real time; Banking—the Cashnet service is offered to major Canadian Banks and their large corporate clients; and Trust Industry—a major integrated software package is offered to the Trust Industry in Canada.

Vendor Name	Datalogics, Inc.	Datanetwork, Inc.	Datasolve Ltd.	Datastream International Ltd.
Address and Phone	30033 Clemens Road Westlake, OH 44145 (216) 835-1329	400 Embassy Square Louisville, KY 40299 (502) 491-1050	99 Staines Road West Sunbury-on-the-Thames, Middlesex TW16 7AH 09327-85566	Monmouth House, 58-64 City Road London EC1Y 2AL, England 01-250 3000
Subsidiary of	Interscience, Inc.	—	Thorn EMI	Dun & Bradstreet International
Principal business	Tandem-based network services; software vendor; facilities manager; consultants	On-line computer service company; software vendor	On-line service company; database producer; off-line service company; maintenance company	On-line service company; database producer
Applications emphasis	Banking and finance; data communications; data management and database management; financial reporting; government; insurance; medical and health care	Accounting; banking and finance; education; engineering and scientific; manufacturing; medical and health care; transportation	Government; banking and finance; media; advertising	Accounting; international data; financial services; interest rates; economics; news media; investment analysis
President	Benson P. Lee	W. Kent Salmon	Christopher J. Wood	Anthony Helman, Managing Director
Director of marketing	Benson P. Lee	James E. Robinson	Margaret Fawcett	Steven Herman
Date founded	1968	1976	—	1964
No. of employees	10; 90 percent devoted to on-line services	11; 100 percent devoted to on-line services	900; 10 percent devoted to on-line services	330; 100 percent devoted to on-line services
Rev. last FY	—	$500K-$999K; 100 percent from on-line services	$50M or more	—
Primary customers	End users	End users	—	Investment analysts, fund managers, banks, dealers
Product line	Provides interactive timesharing, remote batch, and local batch processing. Services include: municipal information systems, international banking systems, facilities management, key entry, and database management systems. Offers an on-line information database, a complete application library, and a market research package. Also provides consulting and custom programming.	Provides general timesharing applications. Also available are custom-designed programs configured from user specifications. Custom applications include budgeting, planning, and civil engineering. Services manufacturing concerns, telephone companies, and banking organizations.	Offers a range of full text on-line products for vertical markets. World Reporter (an international business news and current affair service); World Exporter (a comprehensive export intelligence service); and MAGIC (a marketing and advertising database) are three of the products offered by the company.	Provides the international investment industry and fund managers with comprehensive financial information and computation services. Subscribers have access to statistics on fixed interest investments, equities, companies, markets, interest and exchange rates, economic series, news services, portfolio valuations, and investment accounting.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Datatab, Inc.	Datatel, Inc.	Davis Computer Systems	Deluxe Data Systems
Address and Phone	770 Broadway, 10th floor New York, NY 10003 (212) 475-7800	3700 Mount Vernon Avenue Alexandria, VA 22305 (703) 549-4300	1211 Chestnut Street Philadelphia, PA 19107 (215) 564-4133	8901 N. Kildeer Court Brown Deer, WI 53209 (414) 357-2700
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; software vendor, selling software for use with some Unisys systems	On-line computer service company; database producer; software vendor; facilities manager; consultant; systems and software analysis and design	On-line computer service company; software vendor
Applications emphasis	Accounting; legal; sales and distribution; market research	Accounting; banking and finance; education	Accounting; data communications; data management and database management; engineering and scientific; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; word processing; order processing; job cost accounting	Banking and finance; engineering and scientific; retail trade data
President	Yitzhak N. Bachana	James Hamrick	H. Gus Mechales	Alan G. Brown
Director of marketing	—	William Fanning	Gilbert A. LaMonaca	—
Date founded	1959	1968	1971	1961
No. of employees	150	230; 50 percent devoted to on-line services	25; 40 percent devoted to on-line services	400; 75 percent devoted to on-line services
Rev. last FY	—	$10M-$19M; 100 percent from on-line services	$1.0M-$4.9M; 50 percent from on-line services	—
Primary customers	End users	Financial institutions	Fortune 2000 and medium-sized businesses	Financial institutions, retailers, manufacturing companies
Product line	Provides on-line, batch processing, and data entry services. Available applications include time reporting, billing, invoicing, sales analysis, project costing, accounts payable, and accounts receivable.	Offers on-line and off-line computer services for financial, association, and educational applications. The system is a fully integrated on-line service. The same applications are available for on-line or batch processing.	Provides on-line timesharing and batch processing for business, industry, science, and government. Applications include order processing, inventory control, invoicing, accounts receivable, accounts payable, job cost accounting, payroll, bond underwriting, health care, engineering, scientific, forecasting/modeling, project management, word processing, and general ledger.	Provides on-line and remote processing for electronic funds transfer (EFT), automatic teller machines (ATM), and point of sale (POS) transaction processing. Software is available for sale or lease. The company also provides engineering graphics and finite elements analysis.

Vendor Name	Dial-Tyme	Dialcom, Inc.	Dialogue, Inc.	Digidat Systems, Inc.
Address and Phone	2100 M Street, N.W. Washington, DC 20063 (202) 387-8963	6120 Executive Blvd. Rockville, MD 20852 (301) 881-9020	19 Rector Street New York, NY 10006 (212) 425-2665	7 Westchester Plaza Elmsford, NY 10523 (914) 592-5334
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; facilities manager	On-line computer service company; facilities manager	On-line computer services company; software vendor; consultants	On-line computer service company; off-line computer service company; consultants
Applications emphasis	Data management and database management; insurance; mathematics and statistics	Accounting; data management and database management; payroll and personnel; electronic mail; mailing list generator; general ledger; accounts receivable; billing/invoicing/collection; business related database categories	Data management and database management; market analysis; market research; forecasting; graphics; financial planning	Accounting; medical and health care; medical office accounting
President	Del Clark	John Morris	Arthur I. Stern	Stephen Tombock
Director of marketing	Jerry Henwood	—	Norman H. White	—
Date founded	1978	1970	1969	1969
No. of employees	40	250; 50 percent devoted to on-line services	40; 50 percent devoted to on-line services	15; 50 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	—	$1.0M-$4.9M; 50 percent from on-line services	$200K-$499K; 95 percent from on-line services
Primary customers	Consultants, research development	Corporations, government agencies	Fortune 1000 companies	Medical/dental field
Product line	Provides local and remote batch processing through the company's computer service bureau. Provides low-speed access through Wylbur. The company subscribes to a national communications network.	Provides on-line information for office automation. The user can combine fragmented mailing lists; update mailing lists; target mailing lists into categories; produce schedule reports; log in mail; track pending mail; and produce statistical and analytical reports. Other systems include payroll, general ledger, budget accounting, billing, accounts receivable, and electronic mail.	Provides the Analect Decision Support System, an interactive information analysis system for marketing, sales, production, and financial managers. Sophisticated routines to analyze marketing, financial, or production trends are built into the system. Through its relational database management system, the package handles unlimited quantities of data, and consolidates it into meaningful databases.	Provides accounting and billing services to the medical and dental field through a service bureau atmosphere. The clients' information is entered or changed via batch processing. On-line access is available to clients with CRT terminals.

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COMPANY PROFILES

Vendor Name	Digital Publications, Inc.	Digital Solutions, Inc.	Direct Merchandising Services, Inc.	Distribution Sciences, Inc. (DSI)
Address and Phone	P.O. Box 1409 Norcross, GA 30091 (404) 441-7973	100 Menlo Park Edison, NJ 08837 (201) 549-1700	400 South Edward Street Mt. Prospect, IL 60056 (312) 398-7800	1700 Higgins Road Des Plaines, IL 60018 (312) 699-6620
Subsidiary of	—	—	—	—
Principal business	Database producer	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; off-line computer service company; direct marketing support company	On-line computer service company; off-line computer service company; database producer; software vendor
Applications emphasis	Marketing; computer related information	Accounting; payroll and personnel; construction; accounts payable; accounts receivable; general ledger	Accounting; banking and finance; accounts payable; accounts receivable; general ledger; billing/invoicing/collection; file management; order processing; direct mail; marketing	Transportation; distribution accounting
President	John M. Rapp	Sheldon Kass	Ray Cohen	Stephen R. Smith
Director of marketing	Gordon Jones	Stephen Levine	John Passanante	William J. Pritz
Date founded	1980	1969	1975	1971
No. of employees	15; 100 percent dedicated to on-line services	—	140; 50 percent devoted to on-line services	35
Rev. last FY	$200K-$499K; 100 percent from on-line services	—	$1.0M-$4.9M; 30 percent from on-line services	—
Primary customers	Computer hardware and software manufacturers	End users	Catalog merchandisers, syndicators, space advertisers, direct marketing consultants, list managers, owners	End users (shippers and carriers), consultants, freight auditors
Product line	Provides a database of Digital Equipment Corp. (DEC) computer sites. This database of 125,000 sites is broken down into the following types: PDP-11, VAX, RSTS, Digital Equipment Corp. OEM's, Digital Equipment Corp. salesmen, DECUS chairman, Digital Equipment Corp. consultants, and computer publications.	Provides a management and accounting system designed for the construction industry. Performs functions of payroll, accounts payable, accounts receivable, and general ledger. Also available is information for job cost and management reports. Also provides a programming aid that helps programmers to debug, time, and test the reliability of Fortran code.	Offers total support systems for direct marketing operations. Provides list marketing support systems that include targeting market, forecasting, market segmentation, merge/purge, zip correction, carrier routing, Zip+4, computer letters, labels, lettershop management, and list maintenance. Also provides order processing systems for catalogs, inserts, solos, space ads, premium offers, rebates, and subscriptions.	Provides such software as Match Pay, which is freight rating and payment control software (includes Base Rate); and Base Rate, which is a freight rating, carrier selection, and rate maintenance system. In addition, the company offers such on-line services as Frate Bank, which includes Base Rate, Rand McNally's Milemaker, and Geography Lookup. DSI also offers various databases on mag tape.

Vendor Name	DLM, Inc.	Echo Systems	Econo Data, Inc.	Ecotran Corp.
Address and Phone	920 North Franklin Chicago, IL 60610 (312) 266-2900	4739 Alla Road Marina del Rey, CA 90292 (213) 823-8415	One Lytle Place, #226 Cincinnati, OH 45202 (513) 421-7071	21111 Chagrin Boulevard Beechwood, OH 44122 (216) 991-9000
Subsidiary of	—	Budget-Time Share	—	—
Principal business	On-line computer service company; software vendor	On-line company services; database producer; software vendor; private communications networks, electronic mail, private database access	On-line computer service company; off-line computer service company; software vendor; computer system manufacturer	On-line computer service company; off-line computer service company; laser printing; database typesetting
Applications emphasis	Accounting; payroll and personnel	Data communications; data management and database management; engineering and scientific; media; sales and distribution	Accounting; property management; financial reporting; general ledger	Direct mail; data communications; data management and database management; education; engineering and scientific; management sciences; typesetting
President	Michael Wechter	Steven Rev	Karl A. Corbett	John Massie
Director of marketing	—	Dan Williams	—	Frank Piunno
Date founded	1974	1984	1975	1968
No. of employees	4; 80 percent devoted to on-line services	30; 100 percent devoted to on-line services	12; 50 percent devoted to on-line services	100; 30 percent devoted to on-line services
Rev. last FY	$500K-$999K; 100 percent from on-line services	$1.0M-$4.9M; 100 percent from computer services	$500K-$999K; 45 percent from on-line services	—
Primary customers	Manufacturers, distributors	Fortune 500 companies	End users	End users
Product line	Provides timesharing services for accounting applications. Installs, trains, and consults with customers. The service is available 24-hours a day. Also develops software for the customers' needs.	Offers an electronic mail service which allows microcomputer users to transmit textual and graphic information, including letters, reports, and statistics. ECHO's other services include electronic bulletin boards, users' forums, and databases, including one that features evaluations and ratings of software products.	Provides accounting services for property managers and to nursing homes. Financial reporting and general ledger processing services are available to all industries. Econo Data offers on-line and batch processing through its Cincinnati center.	Provides on-line and off-line processing through the company's Cleveland data center. Specialized routing packages offered, as well as financial planning and database management packages. Offers database typesetting and laser printing.

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COMPANY PROFILES

Vendor Name	EDP Services Company, Inc.	EDS Time-Sharing Systems, Inc.	Electro-Data, Inc.	Electronic Data Processing Corp.
Address and Phone	2930 W. Imperial Highway Inglewood, CA 90303 (213) 757-4101	2150 North Prospect Avenue Milwaukee, WI 53202 (414) 276-6776	1741 Summer Street Hammond, IN 46320 (219) 932-6000	1911 Rowland Street Riverton, NJ 08077 (609) 786-1160
Subsidiary of	—	Computer Services, Inc.	Lizzadro Enterprises	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; consultants	On-line computer service company; off-line computer service company; facilities manager
Applications emphasis	Accounting; payroll and personnel; sales and distribution; accounts payable; accounts receivable; general ledger; job cost accounting	Accounting; data management and database management; government; insurance; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution; transportation	Accounting; payroll and personnel; accounts receivable; accounts payable; job cost accounting; trial balance; general ledger; fixed assets; tax calculation/budgeting/processing	Media; medical and health care; medical literature
President	Frederick F. Schirmer	David Buehler	Mr. Joseph Lizzadro	Albert M. Hosier
Director of marketing	Frederick F. Schirmer	Gene Nygro	Mr. Al Shulman	Robert S. Lewis
Date founded	1966	1968	1969	1962
No. of employees	25; 15 percent devoted to on-line services	20; 80 percent devoted to on-line services	12; 100 percent devoted to on-line services	125; 25 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 25 percent from on-line services	—	$200K-$499K; 100 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	Financial and manufacturing	Credit unions, insurance companies, construction companies	Electrical contractors	Publishers, health and welfare funds
Product line	Provides information processing in an on-line environment. Services provided include general ledger, accounts receivable, accounts payable, payroll, sales and marketing distribution, job cost, accountants' time keeping, and balance sheet profit and loss.	Offers timesharing services through a national networking system providing local dial-up access from most major cities. Provides on-line text editing. Offers program and support services and custom design applications. The languages available include Cobol, Fortran, Basic, and Algol.	Provides timesharing services. The available applications include: accounts receivable with repetitive billing computer generated; accounts payable, aging, purchase journal, and trial balance; material transfer, job costing tracking, estimating, and reporting; general ledger; financial reporting; fixed asset accounting; 1040 tax preparation; and payroll certified with union reports and labor distribution.	Specializes in on-line and off-line computerized processing for circulation fulfillment for magazine publishers and record keeping for health and welfare funds. Services may be performed entirely on-site via large clerical and key entry staffs or at remote locations via teleprocessing. Services include caging, circulation audit preparation (ABC/BPA), list maintenance, bag tags and traffic presorts, and a complete lettershop.

Vendor Name	Electronic Data Systems Ltd.	Electronic Processors Ltd. (EPL)	Electronic Tabulating Corp./TLS	Elite Communication Systems
Address and Phone	Queen's House West, Greenhill Way Harrow, Middlesex, UK HA1 1GR +44 (1) 863 6392	1225 Fifth Avenue North Birmingham, AL 35203 (205) 325-3939	P.O. Box 728 Newburgh, NY 12550 (914) 564-6000	7515 Beverly Boulevard Los Angeles, CA 90036 (213) 938-7126
Subsidiary of	—	America's First Credit Union	—	—
Principal business	On-line computer service company; off-line computer service company; facilities manager; systems integration	On-line computer service company; software vendor, selling software for use with Unisys V310/340/380/500, B/2000/3000/4000	On-line computer service company; off-line computer service company	On-line computer service company; software vendor
Applications emphasis	Banking and finance; insurance; medical and health care; data communications; data management and database management	Credit union accounting	Accounting; insurance; Statistical analysis	Legal; legal office accounting
President	Ross Perot	Robert A. Altman	Von Elbert	Harvey Rich
Director of marketing	—	Sandy N. Greer	Robert Pentico	Alan Rich
Date founded	1962	1977	1959	1947
No. of employees	25,000	70; 100 percent devoted to on-line services/software support	600; 10 percent devoted to on-line services	120; 5 percent devoted to on-line services
Rev. last FY	$50M or more	$5.0M-$9M; 100 percent from on-line services/software sales	$5.0M-$9.9M; 97 percent from on-line services	$5.0M-$9.9M; 5 percent from on-line services
Primary customers	Government, health care, financial institutions, insurance companies	Credit unions	Insurance agents	Law firms
Product line	Provides on-line, timesharing, and batch processing through 5 national data centers. Available applications include savings and loan and credit union services for the financial industry and research and development for government. Also provides applications for utilities, manufacturing, sales and distribution, and transportation. A commercial bank remote computing service is also offered.	Operates an on-line data center offering real-time processing services to credit unions throughout the continental United States. The applications provide for all the accounting required by a credit union to process the services for its membership. The package is also sold for customer in-house use.	Provides terminal on-line processing and batch processing for applications used by insurance agents. The terminal on-line system product is similar to the batch application with certain reports being printed in the agent's office. The terminal on-line system product consists of a terminal installed in the user's office with all input entered onto a tape cassette and transmitted via a telephone network to the computer.	Provides an on-line interactive system for the medium-sized law firm (5-100 attorneys). The user has the full use of an interactive system 24 hours a day, 7 days a week. Elite provides hardware, training, and ongoing software support, all included in the fixed price. Packages provided include billing with management reports, client accounting, calendar and docket, general ledger, and accounts payable.

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COMPANY PROFILES

Vendor Name	EMI AEROCORP, Inc.	Endata, Inc.	Energy Enterprises, Component of GE Information Services	Epsilon
Address and Phone	7 N. Brentwood Boulevard St. Louis, MO 63105 (314) 727-9600	50 Vantage Way Nashville, TN 37228 (615) 244-0244	1560 Broadway, Suite 900 Denver, CO 80202	50 Cambridge Street Burlington, MA 01803 (617) 273-0250
Subsidiary of	—	—	General Electric	—
Principal business	On-line service company; software vendor	On-line computer service company	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. 2060 and IBM PC/XT	On-line computer services company; off-line computer services company; facilities manager; direct marketing services; computer system manufacturer; market research analysis
Applications emphasis	Aviation; weather	Accounting; distribution accounting	Energy; petroleum; oil and gas accounting procedures	Data management and database management; media; sales and distribution; consumer and market research; fund raising; membership management systems; direct mail
President	Steven B. Fuller	Douglas C. Alterbern	Hank Struve	Thomas O. Jones
Director of marketing	—	James M. Barr, Senior Vice President	David Grant Noel	—
Date founded	1981	1969	1971	1969
No. of employees	—	400; 25 percent devoted to on-line services	74; 90 percent devoted to on-line services	700: 20 percent devoted to on-line services
Rev. last FY	—	$20M-$50M; 25 percent from on-line services	$5.0M-$9M; 100 percent from on-line services	$60M or more; 65 percent derived from computer services
Primary customers	Licensed pilots—private and commercial	Wholesale distributors of hardgoods supplies and beverages	Oil and gas companies, consultants, banks, funding companies	End users in membership development, donor fundraising, sales lead generation, subscription fulfillment
Product line	Contains flight planning and weather briefing for the continental U.S. and southern Canada. User chooses among three programs to calculate a complete flight log between any two points.	Provides interactive computing services. Customers can access Endata's mainframe computer through in-house small computer terminals. Endata offers a distribution accounting system including order entry to general ledger. The same software is available via turnkey systems.	Provides on-line remote computing services for the oil and gas industry. Major software products include Economic Evaluation (RAMS-Reserve Analysis and Management System); Production Management System (PMS); Oil & Gas Accounting; Land Management; and Risk Analysis, Reservoir Analysis and Well Testing, petroleum databases (Dwights EnergyData and Hotline).	Offers on-line direct file access for data entry, file inquiry, ordering of output, word processing, and management recording. The company also provides a batch processing environment to use for some or all processing and output generation. Additional applications include fundraising, membership, and market research. Epsilon also provides direct mail and fundraising consulting services.

Vendor Name	Erisco, Inc.	Evansville Data Processing Corp.	Executive Telecom System, Inc.	Expert Information Systems Ltd.
Address and Phone	1700 Broadway New York, NY 10019 (212) 247-2444	1010 S. Weinbach Avenue Evansville, IN 47714 (812) 479-6951	9585 Valparaiso Court, College Park North Indianapolis, IN 46268 (317) 872-2045	38 Tavistock Street London WC2E 7PB, UK 240 0837
Subsidiary of	Thomas National Group	—	Bureau of National Affairs	Whessoe Technical & Computing System
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 370, 4300 systems; facilities manager	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11, VAX, Honeywell DPS6	On-line services company; database producer; private network and file services	On-line service company; database producer; software vendor
Applications emphasis	Banking and finance; insurance; medical and health care	Accounting; general ledger; management reporting systems	Payroll and personnel; labor force information; job recruitment	Transportation; chemicals; chemistry related information
President	Thomas Barrea	Nathan I. Lieberman	John W. Hawkins	Ken Burgess, Managing Director
Director of marketing	Wayne J. Ferrentino	—	Peter D. Blainey	Richard Franklin, Business Development Manager
Date founded	1968	1968	1981	1983
No. of employees	105; 75 percent devoted to on-line services	12	50; 100 percent devoted to on-line services	16; 100 percent devoted to on-line services
Rev. last FY	$10M-$19M; 80 percent from on-line services	$1.0M-$4.9M	—	—
Primary customers	Corporate 1000 companies, commercial banks, insurance companies	End users	Human resource personnel, consultants, corporate librarians, law firms	Shipping companies, emergency services
Product line	Provides on-line access to health claims and benefit recording information. The Claimfact service is a health claims administration system for basic and major medical, dental, vision, prescription drugs, and disability. The Implefacts service contains information on deferred benefits recordkeeping for thrift plans, profit sharing, stock bonus plans, and employee stock option plans.	Provides timesharing for ABLE, a general ledger and management reporting system. Offers integrated systems to retail stores, wholesale distributors, and mail order houses. The software is also available for sale.	Primary product is the Human Resource Information Network, an on-line information retrieval and communication system for human resource professionals. HRIN provides access to a collection of services selected for their relevance to the human resource professional and manager. Other products include private-access information retrieval and communications networks and private database files.	A computerized information retrieval system which covers the transportation, storage, and handling of hazardous cargoes and chemicals. The system provides on-line access to databases containing information on materials, regulations, properties, and commercial aspects. It's designed as a series of separately accessible modules dealing with areas of transport, emergency response, or technical applications.

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COMPANY PROFILES

Vendor Name	Extel Financial & Business Services	Facilities and Services Corp.	FactSet Data Systems, Inc.	Far West Systems
Address and Phone	Lowndes House, 1-9 City Road L London, England ECIY IAA 01 6385544	3243 Wilshire Boulevard, Suite 300 Los Angeles, CA 90010 (213) 385-8282	90 Park Avenue New York, NY 10016 (212) 972-7300	2044 Armacost Avenue Los Angeles, CA 90025 (213) 207-2936
Subsidiary of	Extel Group P.L.C.	—	—	
Principal business	On-line computer services company; database producer; off-line computer services company; software vendor	On-line computer service company; software vendor; turnkey system sales	On-line service company; software vendor	On-line computer service company; software vendor
Applications emphasis	Accounting; banking and finance; insurance; investment management	Insurance	Banking and finance; investment management	Medical and health care; patient accounting
President	Michael W. Warburg	Robert Meyerson	Howard E. Wille	Irwin Mainster
Director of marketing	John B. Shapcott	—	Merle E. Yoder	
Date founded	1968	1980	1978	1974
No. of employees	140	10; 5 percent devoted to on-line services	22; 100 percent devoted to on-line services	25; 70 percent devoted to on-line services
Rev. last FY	—	$500K-$999K; 60 percent from on-line services	—	$1.0M-$4.9M; 70 percent from on-line services
Primary customers	Banks, insurance companies, computing companies, stockbrokers	Property and casualty insurance industry	Institutional investors, corporations, banks	Dental and medical practices
Product line	Provides raw data through various database products. All of these products are associated with financial and investment markets. Extel also operates on-line investment accounting services, and through a subsidiary, various investment software systems.	Provides services to the insurance industry. A.S.P.R.I.N. contains all policy elements to control and produce on-line inquiry for payment status and coverage verification for claims processing. G.A.I.N. provides on-line quoting and policy rating and issuance. R.I.T.E. is designed for firms with many fronting arrangements. On-line policy master inquiry capabilities and accounts receivable and payable are available in W.I.N.	An information technology company for the investment professional. The company provides on-line access to databases offering extensive company financial data, analysts' earnings estimates, daily price records, insider transactions, 13-D filings, and institutional portfolio changes.	Provides a billing and accounts receivable system for patients of dental and medical practices. Establishes control parameter files for each doctor, dentist, or clinic using the system. User tailors the system options to particular requirements such as automatic pricing, delinquency control, and statement and insurance forms preparation. Each user may have files for diagnosis and referring physicians.

Vendor Name	Faxon Company, Inc.	FENIX Timesharing	Financial Interstate Service Corp. (FISC)	Financial Management Systems
Address and Phone	15 Southwest Park Westwood, MA 02090 (617) 329-3350	7150 Shady Oak Road Eden Prairie, MN 55344 (612) 941-9470	P.O. Box 15003, 617 West Main Avenue Knoxville, TN 37901 (615) 637-2035	P.O. Box 4081 Atlanta, GA 30302 (404) 885-8000
Subsidiary of	—	FARGO Electronic Services, Inc.	—	Equifax/Credit Bureau, Inc. of Georgia
Principal business	On-line computer service company; magazine subscription agency	On-line computer service company	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; off-line computer service company; software vendor
Applications emphasis	Library information systems	Accounting; data management and database management; engineering and scientific; manufacturing; media	Banking and finance; payroll and personnel; marketing program services	Accounting; medical and health care; medical office accounting
President	Richard R. Rowe	Robert P. Cummins	Charles Rice	J. A. Baker
Director of marketing	—	Fred W. Potthoff	—	R. W. Wewers
Date founded	1881	1979	1977	1929
No. of employees	800; 80 percent devoted to on-line services	15; 20 percent devoted to on-line services	150	—
Rev. last FY	$50M or more	Under $200,000; 3 percent from on-line services	—	$5.0M-$9.9M; 100 percent from on-line services
Primary customers	Librarians and information specialists	Customers interested in UNIX, Advertising Agencies, Manufacturing Company's	Financial institutions	Doctors, dentists, groups and solo practitioners
Product line	An international subscription and management agency offering an on-line serials management system called LINX. Services include direct access to Faxon's databases (bibliographic/financial); a message switching system; check-in and automatic claiming control of journals; creating, updating and printing journal routing lists; and on-line maintenance of shared holdings information.	Offers computer timesharing with UNIX operating system—Version 32V, U.C. Berkeley's 4.2 distribution. Programming languages provided are C, Fortran, Pascal, APL. End-user applications include job cost, inventory control, general ledger, accounts payable, accounts receivable, and mailing lists. Also offers troff word processing and troff phototypesetting system.	Provides data processing, electronic banking, and information services. Financial Interstate currently offers a choice of more than 100 services and products. FISC services are: financial data processing services; electronic banking products and services; franchise products; and research and development applications. An in-home computer banking service is available to home PC users through CompuServe.	Provides on-line, batch, and turnkey software systems. Available applications include billing, accounts receivable, and management information services for the medical and dental practice industries.

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Vendor Name	Financial Services, Inc. (FSI)	First City Financial Systems	Ford Investor Services	FRI Corp.
Address and Phone	175 Rock Road Glen Rock, NJ 07452 (201) 652-6000	214 North 16th Street McAllen, TX 78501 (512) 682-9413	11722 Sorrento Valley Road, Suite 1 San Diego, CA 92121 (619) 755-1327	1801 McGill College Avenue, Suite 600 Montreal H3A 2N4, Quebec (514) 842-5091
Subsidiary of	—	—	—	—
Principal business	On-line computer service company	On-line computer service company; off-line computer service company; consultants	Database producer; custom programming; newsletter publisher	On-line computer service company; database producer; software vendor; off-line computer service company; consultants
Applications emphasis	Accounting; banking and finance; general ledger	Accounting; banking and finance; payroll and personnel	Banking and finance; investment management	Banking and finance; corporate financial information; investment management; investment analysis; securities; stock information; bonds
President	John J. Schunke	Rupert Richards	David C. Morse	Gordon Landon
Director of marketing	Fred Williams	Rene Garza	—	Nora Rainboth, Vice President Sales
Date founded	1954	1967	1970	1968
No. of employees	125; 100 percent devoted to on-line services	65; 10 percent devoted to on-line services	8; 50 percent devoted to on-line services	90; 80 percent devoted to on-line services
Rev. last FY	$5.0M-$9.9M; 100 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services	—	$5.0M-$9.9M; 100 percent from on-line services
Primary customers	Banks, savings & loans, mortgage bankers	Banks; state, city, county governments	Investment managers, service vendors	Banks, trust companies, insurance companies, investment companies, investment dealers
Product line	Provides on-line services for banking applications. FSI provides the financial community with on-line computer services for: savings accounts, mortgage loans, installment loans, simple interest loans, IRA/Keogh accounts, NOW/checking accounts, and general ledger. FSI supports all major brands of teller terminals and CRTs.	Provides remote computing services and custom programming to the banking industry in the areas of loan accounting, certificate of deposit processing, and investment management.	Provides investment analysis and data compilation services to investors. Resources available include a database of several million entries, updated weekly with financial data on 2,000 common stocks. Services offered include standardized monthly reports (e.g., Ford Value Report) and individualized weekly reports. Also offers timesharing programs to access and analyze the database from client terminals.	Provides portfolio management systems; brokerage client management systems; corporate financial data; stock and bond data; and communications package to investment database.

Vendor Name	Gancom, Inc.	General Computer Management Corp.	GE Information Services	GESCO Corp.
Address and Phone	P.O. Box 1459 Harrisburg, PA 17105 (717) 763-7226	7979 Old Georgetown Suite 900 Bethesda, MD 20814 (301) 656-7300	401 N. Washington Street Rockville, MD 20850 (301) 340-4000	1455 East Shaw Avenue Fresno, CA 93710 (209) 224-8373
Subsidiary of	Gannett Fleming Affiliates, Inc.	—	General Electric	Guarantee Savings and Loan Association
Principal business	On-line computer service company; off-line computer service company; contract programming, Design & Development support	On-line computer service company; software vendor, selling software for use with DEC; IBM System/38/System/34/Series 1	On-line computer service company; software vendor, selling software for use with IBM 4300/303X; Hewlett-Packard 3000; Prime	On-line computer services company; data processing service center
Applications emphasis	Accounting; data management and database management; engineering and scientific; manufacturing; mathematics and statistics; payroll and personnel	Accounting; data management and database management; payroll and personnel; general ledger; job cost accounting; accounts receivable; accounts payable; billing/invoicing/collection	Accounting; banking and finance; data communications; data management and DBMS management; engineering and scientific; government; legal; manufacturing; medical and health care; sales and distribution; transportation; construction; market information; investments	Banking and finance; data processing
President	J. Douglass Berry	John C. Carruthers	Gregory Liemanot	John J. McMenimon
Director of marketing	Harold W. Reinert	Hank Stewart	Arthur J. Marks	—
Date founded	1956	1969	1964	1969
No. of employees	90; 50 percent devoted to on-line services	16; 50 percent devoted to on-line services	5,000	350; 77 percent devoted to on-line services
Rev. last FY	$2.0M-$5.0M; 60 percent from on-line services	$500K-$999K; 80 percent from on-line services	$50M or more	$20M-$50M
Primary customers	Engineering and manufacturing companies	End users such as CPAs & small to medium size companies	End users, primarily in the Fortune 1300's and top local corporations	Savings and loan associations, thrift and loans associations
Product line	Provides personal computer timesharing and standard and customized applications. In addition, end users may use the SAS statistical/graphics package, Applied Data Research products, and ORACLE products for database management and on-line programming. Intergraph computer aided design and drafting (CADD) may be used in a remote environment.	Provides timesharing and interactive processing services. Integrated Financial System (IFS) includes the following modules: general ledger, financial reporting, accounts receivable, and accounts payable. Integrated Membership System (IMES) includes a DBMS for master & subfile relationship and can include all or part of IFS outlined above. Integrated Membership & Financial System (IMFS) includes IFS & IMES.	Offers interactive, conversational timesharing, and remote batch processing services to provide access to a software library of over 2,000 programs. Also provides access to a variety of public databases. The communications and data processing network provide local telephone access in over 600 cities in more than 20 countries. Offers customized software design and development.	A data processing service center, specializing in on-line applications and software systems to financial institutions. Services offered are: mortgages, installment and commercial loans; collection system; savings accounts; NOW accounts; commercial checking; general ledger; real-time ATM system; home banking; leasing systems; and portfolio analysis.

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Vendor Name	Global Analysis Systems Ltd.	Global Villages, Inc.	Graphic Elements	Donald Grenier Corp.
Address and Phone	1285 Avenue of the Americas New York, NY 10020 (212) 713-3009	One Kendall Square Cambridge, MA 02139 (617) 494-0189	5524 Green Oak Drive Los Angeles, CA 90068 (213) 465-8867	43-53 E. Main Street Mahopac, NY 10541 (914) 628-6666
Subsidiary of	—	—	—	—
Principal business	On-line international business analysis; database producer; consulting and research	On-line service company	On-line service company; software vendor	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 360/370/30XX/43XX; facilities manager
Applications emphasis	Banking and finance; investment reporting; economics; economics—international; foreign exchange rates	Data communications; data management and database management; information resource	Accounting; banking and finance; media; graphics	Media; fund raising; subscription fulfillment
President	Maxwell Goodwin, Manager, North American Operations	J. Wesley Kussmaul	David Bohnett	Donald J. Grenier
Director of marketing	A. Hadden, Manager, European Sales	Frederick J. Betz	—	Joel G. Cohn
Date founded	1985	1986	1985	1967
No. of employees	38	7; 100 percent devoted to on-line services	2; 100 percent devoted to on-line services	110; 30 percent devoted to on-line services
Rev. last FY	$2M	—	Under $200,000	$1.0M-$4.9M; 40 percent from on-line services
Primary customers	Banks, brokerage houses, investment analysts, multinational companies	Digital Equipment Corp. users and all vendors of Digital Equipment Corp. equipment	Users of microcomputer graphics software	Publishers, fund raising organizations, direct mailers
Product line	An on-line monitor of important international events, issues, and trends and their implications for overseas investment and trade. Coverage includes 85 country economies, 15 major industrial sectors such as banking and telecommunications, and 13 non-U.S. stock exchanges. The company's database also has modules providing key statistics, risk ratings, and comparitive indicators.	Produces the information network Digital Village. Digital Village offers on-line Special Interest Groups (SIGs) for VAX, RSX, RSTS, UNIX, and 21 other areas of specific interest; and downloadable software. In addition, there is an interactive catalog purchasing system for software and equipment. The company also provides worldwide E-mail, telex, and conferencing in both realtime and standing formats.	Designs software for microcomputer users who require low-cost, high-resolution 35mm color slides from charts and graphs created by Lotus 1-2-3 and other popular business software packages. Users send files via modems to the company where the files are processed into color slides.	Provides interactive and batch processing services for circulation/fulfillment and fund raising applications through their Fulfillment Services Division. The license of proprietary application packages is provided by the Software Division. The Consulting Services Division provides senior project leaders, systems designers, and programmers for custom development at the client's data facility.

Vendor Name	Gulley Computer Associates, Inc.	Hale Systems, Inc.	Haney Group, Inc.	Hartley Data Systems Ltd.
Address and Phone	2300 East 14 Street Tulsa, OK 74104 (918) 744-0100	1076 East Meadow Circle Palo Alto, CA 94303 (415) 494-6111; (800) 922-2111	23241 Ventura Blvd. Woodland Hills, CA 91364-1093 (818) 703-8808	1807 Glenview Road Glenview, IL 60025 (312) 924-9280
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; database producer; off-line computer service company; software vendor; consultants	On-line computer service company; custom software vendor	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. Micro-11; Digital Equipment Corp. PDP-11 series; consulting; turnkey vendor
Applications emphasis	Accounting; engineering and scientific; manufacturing; payroll and personnel	Banking and finance; data management and database management; insurance; management sciences; mathematics and statistics; sales and distribution; securities; commodities	Banking and finance; insurance; management sciences; sales and distribution	Data management and database management; direct mail
President	Dale L. Gulley	Charles Caldevado	Roger A. Haney	Daniel D. Koolish
Director of marketing	Dale L. Gulley	—	Joseph M. Manion	Jerry B. Pilcher
Date founded	1966	1968	1969	1967
No. of employees	7; 40 percent devoted to on-line services	75; 60 percent devoted to on-line services	30; 18 percent dedicated to on-line services	14; 35 percent devoted to on-line services
Rev. last FY	—	—	$1.0M-$4.9M; 50 percent from computer services	—
Primary customers	End users	Financial institutions	Distribution (mail order) and insurance	End users
Product line	Provides timesharing service for firm-developed software. Information is accessible to the user via a terminal, personal computer, or minicomputer. Approximately 50 programs are available through timesharing, with the majority being in an engineering and technical area.	Provides on-line and off-line processing services. Available applications cover financial planning for financial institutions. Produces a historical database containing technical information on stock, bond, and commodities prices. Also offers a disaster recovery service.	Provides management consulting services (corporate systems, controls, and documentation); technology services (information administration, systems development, and systems engineering); processing services (interactive, remote job/batch, and remote networks); administrative services; and facilities management services (office systems, telecommunications systems, and local area networks).	Provides on-line interactive processing for membership management, circulation fulfillment and mailing list maintenance. Services include: record maintenance, billing and renewal notices, listings and labels, and statistical reports. For the membership association, convention and seminar services can handle all registration details and produce name tags. Financial applications are available.

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COMPANY PROFILES

Vendor Name	Haver Analytics, Inc.	HDR Systems, Inc.	Heiwa Information Center Company Ltd.	Heritage Computer Corp.
Address and Phone	800 2nd Avenue, Suite 608 New York, NY 10017 (212) 986-9300	8404 Indian Hills Drive Omaha, NE 68114 (402) 399-1400	Shinjuku Green Tower Building 14-1 Nishi-Shinjuku-6, Shinjuku-ku Tokyo, Japan 160 (03) 349-7791	P. O. Box 58 Sheboygan, WI 53081 (414) 457-1422
Subsidiary of	—	HDR	—	Heritage Mutual Insurance Company
Principal business	On-line services company; database producer; consulting	On-line computer service company; database producer; computer system manufacturer; consultants	Data processing service; software developer; on-line database service; software vendor	On-line computer service company; software vendor
Applications emphasis	Economics; banking and finance; energy; sales analysis; market analysis; data management and database management; manufacturing; forecasting	Banking and finance; engineering and scientific; management sciences; graphics; geography; sales analysis; management reporting systems; financial modeling	Engineering and scientific; insurance; manufacturing	Insurance
President	Maurine Haver	William Preston	Kohei Miyata	Jens P. Christensen
Director of marketing	—	Ronald Gillespie	—	John V. Moll
Date founded	1978	1969	1971	1969
No. of employees	—	45; 25 percent devoted to on-line services	230	60; 70 percent devoted to on-line services
Rev. last FY	—	—	$25.0M	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	Analysts in finance, marketing and business planning, librarians	Government, universities, utilities, financial institutions, engineering & scientific organizations	Large companies; organizations	Small-to-large size property/casualty insurance companies
Product line	Produces business models and forecasts through QMOD (Quick Model System) and QDATA (Quick Data System). Also offers data-access systems for displaying, downloading, and analyzing data. These provide tools for forecasting, model building, and database management. In addition, the company offers custom PC databases with flexible database access software.	Provide timesharing services throughout the United States and to some foreign countries. Offers financial modeling and a geographic-based analysis system. Also provides sales analysis and management reporting. Offers database management hardware, software and consulting services.	Provides database services, data processing services, and data input for storage. The company also develops data systems, and sells data processing equipment and software packages (which run on FACOM M and IBM MVS compatible systems). In addition, the company distributes databases containing news, marketing info for Japan, and economic and trading info for Japan and 100 other countries.	Provides a complete line of property and casualty software. The offered systems include a fully functioning relational DBMS, a data dictionary, and a fourth generation ad hoc query language (Natural). The following major insurance functions are included: Premium Processing, Statistical and Management Reporting, Bureau Reporting, Claims and Loss Handling, Quoting, and Cash Management.

Vendor Name	Herrmann Graphic Technologies	Hydro-Air Engineering, Inc.	Hydrocomp, Inc.	IDC Data Services
Address and Phone	7810 Tioga Street Pittsburgh, PA 15208 (412) 243-2374	P.O. Box 7359 St. Louis, MO 63177 (314) 567-7127	201 San Antonio Circle, Suite 280 Mountain View, CA 94040 (415) 948-3919	1225 Franklin Avenue Garden City, NY 11530 (516) 294-6040
Subsidiary of	Hermann Printing & Litho, Inc.	Moehlenpah Industries	—	IDC Services
Principal business	On-line computer services company; on-line typesetting	On-line computer service company	On-line computer service company; database producer; software vendor; consultants	On-line computer service company; software vendor, selling software for use with Wang VS systems
Applications emphasis	Data communications; legal; media; typesetting	Engineering and scientific; construction	Engineering and scientific; environment	Accounting; data management and database management; media; job cost accounting
President	Eugene V. Herrmann, Jr.	Michael D. Conforti	Norman H. Crawford	Paul M. Roth
Director of marketing	Daniel J. Makuta	Robert E. Parker, Director of Marketing and Sales	Norman H. Crawford	Mary Ann Bohman
Date founded	1955	—	1966	1976
No. of employees	31; 25 percent devoted to on-line services	200; 10 percent devoted to on-line services	6	30; 100 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M	—	$200K-$499K; 20 percent from on-line services	—
Primary customers	Catalog, magazine, and newsletter editors	Construction industry	End users; such as, planning commissions, local government, power companies	—
Product line	Provides an on-line computerized typesetting service. Offers professional typesetting utilizing Typelink, a proprietary typesetting system that interfaces client computers or word processors to sophisticated typesetting equipment via telecommunications or media conversion.	Provides timesharing for engineering design services. Programs are designed to determine forces and moments in determinate wooden trusses; select timber sizes and grades, metal connector plate sizes and locations; and calculate estimating aids.	Provides on-line timesharing services to applications analyzing hydrologic, water quality, and water resource planning problems. The main areas of concentration are R&D of water resource simulation methods and the application of these to water resource problems. Also produces two databases, Watershed Database and Time Series Database, which contain meterologic and hydrolic data.	Offers systems to the advertising community. Functions include media planning, media tracking, media buying, media accounting, client accounting, agency accounting, and production job accounting.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	IMS/Adserve, Inc.	In-Situ, Inc.	Industrial Life Technical Services	InfoMed
Address and Phone	15 East 41st Street New York, NY	P.O. Box I Laramie, WY 82070-0920 (307) 742-8213; (800) 4-INSITU	1611 Cremaie Blvd. Montreal H2M 2P2, Canada (514) 838-1611	1041 Route One Princeton, NJ 08540 (609) 987-8181
Subsidiary of	—	—	Industrial Life Insurance Company	—
Principal business	On-line computer service company; software vendor, selling, software for use with Ultimate, Microdata Reality, Adds Mentor, Pick	On-line computer service company; software vendor, selling software for use with on In-Situ's Digital Equipment Corp. VAX 11/780, personal computers, and In-Situ's logic monitoring instruments; custom programming	On-line computer service company; facilities manager; consultants	On-line computer service company
Applications emphasis	Advertising and sales promotion	Engineering and scientific; mathematics and statistics; mining and mineral exploration; hydrological technologies; oil and gas exploration	Accounting; data management and database management; insurance; agriculture; data processing; statistical analysis; economics; project management; graphics	Data communications; data management and database management; payroll and personnel; accounts receivable; general ledger; patient registration and scheduling; accounts payable
President	D. B. Shine	Chester R. McKee	Maurice Martel	Frederick Neufeld
Director of marketing	Leon Kottleman	John E. Benedik, Jr.	André Thompson	Robert B. Cullinan
Date founded	1981	1976	1974	1969
No. of employees	—	30; 20 percent devoted to on-line services	550	70; 75 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 50 percent from on-line services	$1.0M-$4.9M; 20 percent from on-line services	$20M-$50M; 90 percent from on-line services	—
Primary customers	—	Mining & oil companies; research institutions; government agencies.	End users	Home care agencies and hospital home care programs
Product line	Provides timesharing services for advertising agencies. Available applications include media, production, accounting, client profitability, petty cash, and payroll. Full production control systems are available for manufacturing companies. The timesharing services in America are provided by the New York City and Toronto data centers.	Has over two dozen programs available on its VAX 11/780 system, mostly In-Situ proprietary software. There are also selected public-domain software programs for mining, hydrology, and oil and gas. A number of programs have been adapted for use with IBM-compatible personal computers. Timesharing is available via Telenet or direct dial, with Fortran, Basic, and Cobol.	Provides on-line processing for the client's specific needs, such as: IST-AGRO, Agri-business Sector (food processing and distribution); IST-CANFARM, Agri-business Sector (production); IST-SMA, Social Affairs Sector; IST-INPRO, Municipal Sector, and IST-Computer Services.	Provides its clients with an accounts receivable and statistical system. The processing run updates the client's database and produces bills, reports, and a comprehensive audit trail specifying the actions taken on each transaction entered into the system. The system also produces third party claims on tape-to-tape or electronic format for submission to fiscal intermediaries.

Vendor Name	Information & Financial Services, Inc.	Information Consultants, Inc. (ICI)	Information Management International	Information Resources, Inc.
Address and Phone	580 West Germantown Pike, Plymouth Plaza, Suite 105 Plymouth Meeting, PA 19462 (215) 834-1700	1133 15th Street N.W. Washington, DC 20005 (202) 822-5200	1101 S. Winchester Boulevard San Jose, CA 95128 (408) 248-8250	200 Fifth Avenue Waltham, MA 02254 (617) 890-1100
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. mainframes and minicomputers	On-line computer service company; database producer; off-line computer service company; software vendor; facilities manager; consultants	On-line computer service company; off-line computer service company; software vendor; facilities manager; consultants	On-line computer service company; software vendor, selling software for use with IBM 4331 and larger; Prime 2250 and larger; consultants
Applications emphasis	Accounting; data management and database management; management sciences; inventory control	Data management and database management; government; management sciences; mathematics and statistics; medical and health care; payroll and personnel; graphics; text processing; budget systems; electronic mail; chemistry related information	Accounting; banking and finance; medical and health care	Banking and finance; management sciences; sales and distribution; financial reporting; budget systems; investment analysis; sales and market information
President	D. Jerard Aman	Martin Beer	Allen Guggenheim	Gian M. Fulgoni
Director of marketing	Gary E. Boyles	J.T. O'Brien	Jack Lohrey	—
Date founded	1977	1970	1969	1967
No. of employees	20; 80 percent devoted to on-line services	80; 80 percent devoted to on-line services	200; 70 percent devoted to on-line services	220; 50 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 80 percent from on-line services	—	$10M-$19M; 95 percent from on-line services	$20M-$50M
Primary customers	Government, banks, wholesale distribution, small manufacturing companies	—	Debt collectors, health care agencies, direct mailers, unions, and non-profit credit/collection agencies	End users and systems builders
Product line	Offers Management Decision Support Systems via timesharing. Provides systems integration of microcomputer, cash registers, and workstations with host computers. Also offers a complete account and inventory management application. Sells and leases terminals, microprocessors, and minicomputer systems.	Provides on-line timesharing and batch processing. Additional applications include text processing and retrieval, and budget planning. Offers custom design programming and standard program tailoring to fit specific user needs. Also provides computer facilities and professional support for large private and public database owners and the same type of support for litigation of large cases.	Provides on-line, remote batch, and batch processing. Home health care agency services include batch, remote-batch entry, and in-house standalone processing of patient abstracts, billing, and required reports. Credit collection services include billing and receipting, agent and contract information, special skill casting and work clearances, and residual trust accounting.	Provides a decision support system and database management product for the information center called EXPRESS. It offers applications in corporate planning, financial reporting and analysis, budgeting, business planning, cash management, investment analysis, operations planning, sales reporting, and marketing analysis. EXPRESS has a database management system.

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COMPANY PROFILES

Vendor Name	Information Science, Inc.	Information Systems Design, Inc (ISD)	Informationszentrum RAUM und BAU der Fraunhofer Gesellschaft (IRB)	Inline Services
Address and Phone	95 Chestnut Ridge Road Montvale, NJ 07645 (201) 391-1600	2025 Gateway Place, Suite 260 San Jose, CA 95110	Nobelstrasse 12 D-7000 Stuttgart 80 (+49 711) 68 68-500, Telex 7 255 167	P.O. Box 4717 Tulsa, OK 74104 (918) 584-4840
Subsidiary of	—	Control Data Corp.	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with Microdata Reality Series 6000, 8000, etc.; maintenance company; consultants	On-line computer service company; off-line computer service company	Database producer; on-line computer service company	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11; consultants
Applications emphasis	Payroll and personnel; utilities software	Engineering and scientific; graphics; electronics and computer information	Education; engineering and scientific; government; media; legal; urban planning; metals; transportation; construction; project management	Accounting; management sciences; payroll and personnel; transportation; accounts receivable; accounts payable; general ledger; order processing; word processing
President	John Rade	—	Dr. Wilhelm Wissmann	Leah C. Waddell
Director of marketing	Nina Scozzari	—	F. Frank; Mr. Martin Herr	E. P. Mace
Date founded	1965	1966	1977	1978
No. of employees	250	—	65; 10 percent devoted to on-lie services	5
Rev. last FY	$20M-$50M; 35 percent from on-line services	—	—	Under $200,000
Primary customers	Cross-industry suppliers	—	—	End users in small businesses
Product line	Provides on-line and batch information reporting services for human resource management. Applications include salary administration, compensation, payroll, personnel, termination, Employee Retirement Income Security Act (ERISA), Equal Opportunity Employment (EOE) and Occupational Safety and Health Administration (OSHA). Hard copy output is available. Additional options provide for applicant tracking.	Provides on-line timesharing and batch processing services. Offers nationwide access through network services. Their engineering applications include electronics. The company also offers graphics and plotting capabilities, IBM PC/XT/AT based graphic schematic entry, and library and interface software.	Produces databases: BAUFO and BODO—deal with urban planning, particularly in German-speaking countries; FORS—a tool for the coordination of research in the Republic of Germany; LINA—covers civil engineering; ORLIS 1974-78—scientific and technical literature concerning urban planning; PASCALBAT and RSWB—info on French urban planning; and ICONDA—deals with construction.	Provides service bureau facilities, on-line timesharing, and turnkey systems. Applications include accounts receivable, accounts payable, general ledger, sales analysis, order entry, word processing, legal time management, transportation fuel, and maintenance cost analysis.

Vendor Name	Intellectron, Inc.	Interactive Data Corp.	Interactive Information Systems, Inc.	Interactive Market Systems (IMS)
Address and Phone	6711 Valjean Avenue Van Nuys, CA 91406 (213) 988-5670	95 Hayden Avenue Lexington, MA 02173-9144 (617) 863-8100	546 Penn Avenue West Reading, PA 19611 (215) 375-4231	55 Fifth Avenue New York, NY 10003 (212) 924-0200
Subsidiary of	—	The Chase Manhattan Bank, N.A.	NSA, Inc.	—
Principal business	On-line computer service company; off-line computer service company	On-line computer services company; database producer; software vendor	On-line computer service company; software vendor, selling software for use with NCR 8000 Series & 9000 Series Equipment using the I operating system	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM micros; facilities manager; consultants; training in micro and on-line applications
Applications emphasis	Medical and health care; medical office administration	Investment reporting; securities; banking and finance; data management and database management; government; insurance; management sciences; investment reporting; marketing; corporate planning	Accounting; banking and finance; manufacturing; sales and distribution; apparel related industry	Media; graphics; administrative systems
President	William C. Clauer	John Rutherfurd, Jr.	Russell A. Hinnershitz, Jr.	Richard Makely
Director of marketing	Gerald Friss	Rob Guarnieri	Joseph Garvey	Beverly Andal
Date founded	1968	1968	1976	1969
No. of employees	125; 30 percent devoted to on-line services	700	25; 10 percent devoted to on-line services	225; 85 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 90 percent from on-line services	$50M or more; 90 percent from on-line services	$1.0M-$4.9M; 10 percent from on-line services	$5.0M-$9.9M
Primary customers	Physicians, health care providers	Banks, brokerage firms, insurance companies, investment management firms, large companies	Savings & loans, manufacturers, distributors	Publishers, advertising agencies, advertisers, broadcast media, marketers
Product line	Provides on-line, batch, or mail-in mode processing. Offers a complete system for the administration of medical offices. The applications include accounts receivable, collections, bills insurance claims, patient statements, and managements reports.	Provides securities and financial databases. Interactive Data also provides investment research and portfolio management application software, securities database management systems, and pricing services for mutual funds and back office operations. Services are available directly on-line to microcomputers or dumb terminals, via CPU to CPU transmission, or on tape.	Provides full accounting systems in the areas of manufacturing, job cost, and the knitting and apparel industry. Also provides accounting, savings, and loans processing for the savings and loan industry.	Provides micro software and interactive on-line media, marketing, and administrative systems for advertising and marketing environments. Services include market and media survey cross tabulation, reach and frequency analysis, optimization, cost ranking and efficiency, advertising-campaign modeling, MIS systems, and graphics and statistical packages. Provides on-line access to over 3,200 databases.

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COMPANY PROFILES

Vendor Name	International Business Machines Information Services Information Network (IBM IN)	Interpretive Data Systems	Investment Technologies, Inc.	ISI Systems, Inc.
Address and Phone	3405 West Buffalo Avenue P.O. Box 30021 Tampa, FL 33630-3104 (813) 872-3000	1500 Shelburne Road Burlington, VT 05402 (617) 566-6800	510 Thronall Street Edison, NJ 08837-2212 (201) 494-1200	161 Forbes Road Braintree, MA 02184 (617) 848-4620
Subsidiary of	—	—	—	—
Principal business	Value-added network; networking; remote computing; connections to software, databases	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11 and VAX Family; maintenance company	On-line computer service	On-line computer service company; software vendor
Applications emphasis	Inter- and intra- enterprise computer-to-computer connections for handling buying, selling, and shipping transactions, inventory and account status queries, and financial reporting	Data communications; medical and health care	Banking and finance; investment management; stock information	Insurance
President	Syd N. Heaton, General Manager	Richard Tarrant	Lawrence Silberstein	Charles C. Johnston
Director of marketing	Edward D. Markham	Jim Crook	—	William J. Goff, Exec. V.P. Marketing
Date founded	1982	1969	1983	1969
No. of employees	—	300; 80 percent devoted to on-line services	18; 100 percent devoted to on-line services	325; 50 percent devoted to on-line services
Rev. last FY	—	$20M-$50M; 90 percent from on-line services	$200K-$400K; 100 percent from on-line services	$20M-$50M
Primary customers	Cross-industry	Medical groups, hospitals, clinics	End users (novice and experienced investors), portfolio managers, traders	Insurance companies, end users
Product line	Networking includes: Network Services, Information Exchange, EDI Services, Electronic Support Facility, and Insurance Communication Service; remote computing services include: PROFS and Application System; and information services include: DB-View with its connection to commercial corporate financial data.	Provides timesharing and batch processing services to large medical groups, university affiliated physicians, private clinics, and hospital out-patient departments. Available applications include physician billing, accounts receivable, insurance claims tracking, financial reporting, patient registration, general ledger, accounts receivable, and management reporting. Nationwide access is available.	Provides on-line programs that evaluate investment portfolios, screen for new investment opportunities, and provide technical and fundamental analysis of individual stocks, options, and commodities. These programs are offered on one complete system, together with an extensive, automatically updated historic database.	Provides on-line services for insurance companies. Provides automated processing of private passenger and commercial automobile insurance in MA and assigned risk automobile insurance in other states. The range of tasks extend from processing the initial application through underwriting, policy issuance, and billing. Additional services include MA merit rating and MVR processing.

Vendor Name	Ja Net Global Securities	Jacobsen and Associates, Inc.	Jefferson Pilot Data Services, Inc. (JDS)	Kaman Sciences Corp.
Address and Phone	931 Austin Avenue Salt Lake City UT 84106 (801) 485-9585	10229 Lower Azusa Road Temple City, CA 91780 (818) 575-7504	501 Archdale Drive Charlotte, NC 28217 (704) 529-3901	1500 Garden of the Gods Road, P.O. Box 7463 Colorado Springs, CO 80933 (303) 599-1450
Subsidiary of	—	—	—	Kaman Corp.
Principal business	On-line service company; database producer	On-line computer service company	Information processing/data communications	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM System/38
Applications emphasis	Banking and finance; data communications; data management and database management; government; legal; manufacturing; media; sales and distribution	Accounting; banking and finance; management sciences; manufacturing; payroll and personnel	Media; broadcasting	Accounting; media
President	Maureen Janney	Kenneth R. Jacobsen	Mike Jones	Albert Bridges
Director of marketing	—	Gerald I. Parker	Doug Rother	George T. Beattie
Date founded	1985	1969	1969	1968
No. of employees	10; 75 percent devoted to on-line services	30; 50 percent devoted to on-line services	300; 60 percent devoted to on-line services	700; 10 percent devoted to on-line services
Rev. last FY	$500K-$999K; 95 percent from computer services	$1.0M-$4.9M; 85 percent from on-line services	$20M-$50M; 60 percent from on-line services	—
Primary customers	End users, corporations	Industrial manufacturers	Broadcast stations, advertising agencies, cable systems	Broadcast stations
Product line	Producers of the International Entrepreneur database. The database provides companies, individuals, and governments with classified ads for items for sale or trade.	Provides a management information service for industrial manufacturing control, accounting, and finance. The information is available from a service bureau through on-line real time. Also available are software lease/purchase services and turnkey installations.	The company's BIAS (Broadcast Industry Automation System) provides on-line computer services for broadcast stations for sales, accounting, traffic, and engineering. Its primary product lines are REPLINE and SESAMI systems for national sales rep, station sales, and research applications. The JDS Medialine system is an on-line service for advertising agencies and media buying services.	Provides in-house on-line processing services. Computer services are available for business, sales, traffic, news, and films automation interface. Also produces broadcasting systems that include software for electronic switching interface, and word processing. The systems are available as turnkey systems or on a monthly lease arrangement.

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COMPANY PROFILES

Vendor Name	Kennedy and Coe Data Processing Services	Keydata Corp.	Landart Systems, Inc.	Litton Computer Services
Address and Phone	P.O. Box 1100, United Building Salina, KS 67401 (913) 825-1561	85 E. Belcher Road Foxboro, MA 02035 (617) 543-7921	65 Boradway, 11th Floor New York, NY 10006 (212) 363-3170	1831 Michael Faraday Drive Reston, VA 22090 (703) 471-9200
Subsidiary of	Kennedy and Coe, C.P.A.'s	—	—	Litton Systems, Inc.
Principal business	On-line computer service company; off-line computer service company; consultants	On-line computer service company	On-line computer service company; off-line computer service company; consultants	On-line computer service company; off-line computer service company; nonshared (dedicated) computing
Applications emphasis	Accounting; education; engineering and scientific; legal; medical and health care; sales and distribution; agriculture	Order processing; billing/invoicing/collection; inventory control; accounts receivable; sales analysis	Banking and finance; engineering and scientific; insurance; mathematics and statistics; graphics; financial modeling	Accounting; data communications; data management and database management; education; engineering and scientific; government; insurance; legal; management sciences; manufacturing; payroll and personnel; word processing; tax calculation/budgeting/processing
President	—	Robert Bienkowski	John Gilmour	L. G. Fondiler, Vice President
Director of marketing	John Page	Harry Valencia	—	John L. Cudworth, V.P. of Business Dvpt.
Date founded	1960	1959	1973	1968
No. of employees	25; 70 percent devoted to on-line services	50	—	500; 100 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 70 percent from on-line services	—	—	—
Primary customers	Accounting, agriculture, engineering, legal, nursing homes, motels, restaurants, manufacturing, retailers	End users	Cross-industry	End users
Product line	Provides on-line dial-up, batch processing, remote processing, and data entry services. Applications include: accounts receivable; general ledger; payroll; billing and invoicing; sales analysis and forecasting; project costing; labor distribution and time reporting; property management and fixed asset accounting; attorney management; income tax return processing; and accounts payable.	Provides interactive processing services. Offers a range of distribution-oriented applications to distributors and manufacturers. The services are designed for companies with annual sales of $2 million or more. Applications include: order processing, invoicing, inventory control, accounts receivable, accounts payable, report writing, word processing, purchase order, general ledger, financial reporting, and sales analysis.	Offers timesharing services on a national basis and to major cities worldwide through networks. Available applications include electronic publishing, laser printing, and computer graphics. Also provides computer output using a Xerox 9700. Designs customized applications to fit user needs.	Provides timesharing, batch processing, and remote job entry services. Offers computer graphic services, PC/Mainframe communications, business printing services, word processing, and database management. Available language compilers include Cobol, Fortran, PL/1, Assembler, APL, RPG, Basic, and Pascal. Also provides automated typesetting and photocomposition and plotting.

Vendor Name	Lockheed Data Plan, Inc.	Lynch Data Processing	MTech Ohio Valley	Madison Academic Computing Center (MACC)—University of Wisconsin
Address and Phone	90 Albright Way Los Gatos, CA 95030 (408) 866-7611	740-A Industrial Drive Cary, IL 60013 (312) 639-2351	2515 Washington Boulevard Belpre, OH 45714 (614) 423-9501	1210 West Dayton Street Madison, WI 53706 (608) 262-2054
Subsidiary of	Lockheed Corp.	—	—	—
Principal business	On-line computer services company; transportation information services	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; software vendor; facilities manager; maintenance company; consultants	On-line computer service company; off-line computer service company
Applications emphasis	Transportation; aviation; weather; graphics	Accounting; accounts receivable; order processing	Accounting; banking and finance; data communications; education; engineering and scientific; payroll and personnel; sales and distribution	Data management and database management; engineering and scientific; mathematics and statistics; graphics; electronic mail; education
President	Al Curtis	Roberta W. Lynch	R. W. Bom	—
Director of marketing	—	John G. Lynch	Stanley Cox	Ann P. Schutt
Date founded	1982	1964	1964	1966
No. of employees	95; 85 percent devoted to on-line services	14; 36 percent devoted to on-line services	130; 25 percent devoted to on-line services	70; 100 percent devoted to on-line services
Rev. last FY	$10M-$19M	$200K-$499K; 100 percent from on-line services	$5.0M-$9.9M	$5.0M-$6M; 50 percent from on-line services
Primary customers	USAF; RAF; Canadian Armed Forces; airlines; corporations	Manufacturers, distributors, financial institutions	Financial institutions	Researchers, professors, students, social and natural scientists, engineers, academic personnel
Product line	Supplies computerized flight plans on its advanced, optimized route system called JetPlan. Provides computerized weather information and graphics via MetPlan. The company serves the USAF with a military version of JetPlan called MacPlan. OpsPlan is an aviation information management system that organizes the aviation manager's MIS, scheduling, maintenance, and inventory functions.	Provides interactive and batch processing services. The applications available via interactive processing include accounts receivable and order entry invoicing. General accounting applications are available through the batch services. Also offers a telephone bill paying plan.	Provides on-line and off-line processing services. Area of specialization is banking applications. Also offers small business system applications. Currently serving Southeast Ohio and West Virginia.	Provides timesharing and networking services. Applications include statistical, mathematical, bibliographic, modeling, operations research, information handling, electronic mail, and type composition. The organization has tape conversion capabilities, laser printing, and plotter and color graphics capabilities. In addition, MACC also offers contract programming, user consulting, and training.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Management Analysis by Computer, Inc.	Management Computer Services, Inc.	Management Concepts, Inc.	Management Science Associates, Inc.
Address and Phone	P.O. Box 3090 Guttenberg, NJ 07093 (201) 869-2418	2790 Fisher Road Columbus, OH 43204 (614) 272-0202	1640 Powers Ferry Road, Building 20 Marietta, GA 30067 (404) 955-4024	6565 Penn Avenue at Fifth Pittsburgh, PA 15206-4490 (412) 362-2000
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; software vendor for Digital Equipment Corp. PDP-11; computer system manufacturer; maintenance company	On-line computer service company; off-line computer service company; software vendor, selling software for micros and minis; facilities manager; PC micro sales/systems	On-line computer service company; off-line computer service company; consulting; analytical services
Applications emphasis	Accounting; banking and finance; data management and database management; engineering and scientific; management sciences; mathematics and statistics; payroll and personnel; sales and distribution; graphics; inventory control; word processing; electronic mail	Accounting; insurance; legal; payroll and personnel; sales and distribution; inventory control; country club accounting procedures; membership management systems; automotive	Accounting; data management and database management	Data management and database management; management sciences; mathematics and statistics; sales and distribution; marketing program services; advertising
President	Dr. Virgil C. Harrington	Donald A. Turner	E. J. Solomon	Alfred A. Kuehn
Director of marketing	Dr. Virgil C. Harrington	—	—	Patrick L. Flannery, Executive Vice President
Date founded	1977	1964	1970	1963
No. of employees	2; 100 percent devoted to on-line services	55; 80 percent devoted to on-line services	10; 90 percent devoted to on-line services	250; 50 percent devoted to on-line services
Rev. last FY	—	$1.0M-$4.9M; 80 percent from on-line services	—	—
Primary customers	Newspapers, consulting firms, CPA firms	—	Cross-industry	Consumer packaged goods manufacturers, end users, advertising agencies
Product line	Provides remote computer timesharing for a variety of applications including accounting, statistics, database management, report generation, word processing, cash flow analysis, order entry, inventory control survey analysis, engineering, electronic mail, spreadsheets and graphics. The business applications includes profitable analysis, return on investment, and modeling for product line pricing.	Provides timesharing services through the company's Dallas, TX data center. Services include applications for country club accounting, association membership, car dealership accounting, and inventory control. Performs consulting on applications and computer hardware. Also training and maintenance services for the software and hardware products.	Provides timesharing and batch processing for accounting applications. The software packages are also available for sale. Application software is available for association, construction, and real estate markets on micro and minis.	Provides interactive and batch processing services. The applications available through both on-line and off-line processing include: marketing information systems; decision support systems; electronic store scanner data analysis; questionnaires and store audit data analysis; sales analysis; marketing analysis and strategy; advertising and media systems; and consumer diary panel analysis.

Vendor Name	Management Systems Corp.	Managistics, Inc.	ManTech Services Corporation	Manufacturing Decisions Support Systems, Inc.
Address and Phone	5201 Green Street Salt Lake City, UT 84123 (801) 264-2400	32-31 57th Street Woodside, NY 11377 (718) 545-6200	2121 Eisenhower Avenue Alexandria, VA 22314 (703) 838-5700	300 East Ohio Building, 1717 East Ninth Street Cleveland, OH 44114 (216) 861-8100
Subsidiary of	—	—	ManTech International Corp.	—
Principal business	On-line computer service company; software vendor	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; maintenance company; consultants	Software vendor, selling software for use with Hewlett-Packard 3000 series; on-line computer service company; consultants
Applications emphasis	Accounting; insurance; medical and health care	Payroll and personnel	Accounting; data management and database management; engineering and scientific; government; management sciences; payroll and personnel; sales and distribution; construction	Accounting; manufacturing; sales and distribution; purchasing management; inventory control; accounts receivable; accounts payable; general ledger; financial reporting; cost accounting; sales analysis; forecasting
President	Ray R. Hansen	Steve Murphy	R.P. Gregory	Milton N. Allen, Chairman
Director of marketing	—	—	—	John A Liebert, President and Director of Marketing
Date founded	1969	1968	1969	1968
No. of employees	105	250; 30 percent devoted to on-line services	80	—
Rev. last FY	$10M-$19M	—	$1.0M-$4.9M	—
Primary customers	End users	End users; services vendors	Commercial and government clients	Manufacturing companies
Product line	Provides timesharing and remote job entry services. Offers software for accounting and financial applications, medical clinics, and claims processing.	Provides payroll and personnel related data services for thousands of companies in the eastern corridor. This service is provided either in traditional or off-line features. Among these is PayNet, the first on-line payroll service which allows customers to enter payroll data, do inquiries, as well as design and produce custom reports at their office.	Provides interactive and batch processing. Available applications range from accounting to process control to list maintenance.	Provides on-line processing, software and consulting services for manufacturing companies. Available applications include product data control; master production scheduling; manufacturing requirements planning; inventory management; purchasing management; shop floor control; job cost and labor efficiency; sales orders and invoicing; marketing management; and accounts receivables and payables.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Manus Services Corp.	Marketron	Marmen Computing	Marshall & Swift
Address and Phone	1130 Rainer Avenue, South Seattle, WA 98144 (206) 325-2200	101 Lincoln Centre Drive, Suite 300 Foster City, CA 94404 (415) 341-4004	P.O. Box 176, 125 6th Avenue Menominee, MI 49858 (906) 863-2611	1200 Route 22 Bridgewater, NJ 08807 (201) 231-8920
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11; database consultants	On-line service company; broadcast computer service company; computer system manufacturer	On-line computer services company	On-line computer service company; database publisher
Applications emphasis	Accounting; payroll and personnel; sales and distribution; distribution accounting; direct mail	Media; sales and market information; market research	Accounting; data communications; data management and database management; government; manufacturing; payroll and personnel; sales and distribution	Construction
President	Clifford Asplund	Jerome P. Cronin	Barry A. Berquist	Timothy Marshall, CEO
Director of marketing	Larry Granston	—	John Hofer	Kevin M. Keegan, Vice President of Marketing
Date founded	1969	1971	1970	1932
No. of employees	100; 50 percent devoted to on-line services	73	42; 50 percent devoted to on-line services	—
Rev. last FY	$5.0M-$9.9M; 80 percent from on-line services	$5.0M-$9.9M	—	—
Primary customers	End users	Television and radio stations, media agencies, media representatives	—	Appraisers; insurance companies, real estate agents; governments; and construction industry
Product line	Offers timesharing and batch processing services to customers in the Pacific Northwest. Primary services include general accounting, wholesale distribution, and direct response marketing. Specialty markets include automotive parts warehouse distributor systems, and fuel oil dealer systems.	Provides a sales and research system with on-line access to audience listening and viewing data researched by The Arbitron Company, Birch, and A. C. Nielsen Company. Timesharing services are provided. This service is available in-house. Other broadcasting applications include in-house minicomputers, self-assembled for traffic and accounting business applications for television and radio stations.	Provides on-line access to various special purpose databases, and custom system design, programming, and software maintenance. The company also provides management and technical consulting in the areas of data communications, DBMS, and industry specific applications. Marmen Computing's software will run on IBM 4341 systems.	Provides building cost services for professionals in construction, insurance, real estate, and assessment throughout the US and Canada. This information is used to estimate new and/or repair and remodeling construction costs for commercial and residential buildings. The company also provides depreciation information to determine insurable values, market values, and tax assessment.

Vendor Name	Martin Marietta Data Systems (MMDS)	Master Data Center, Inc.	MBA Systems Automation	McDonnell Douglas Communications Industry Systems Company
Address and Phone	6303 Ivy Lane Greenbelt, MD 20770 (301) 982-6500	29100 Northwestern Highway, 300 Franklin Center Southfield, MI 48034-1095 (313) 352-5810	611 E. Webber Road Columbus, OH 43211 (614) 447-0100	5299 D.T.C. Boulevard, Suite 1400 Englewood, CO 80111-3305 (303) 220-6000
Subsidiary of	Martin Marietta Corp.	—	—	—
Principal business	On-line computer service company; software vendor; facilities manager; computer system manufacturer; consultants	On-line service company; software vendor	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11/70/VAX; maintenance company; consultants	On-line information service company; software development; systems integration
Applications emphasis	Banking and finance; data communications; data management and database management; education; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; project management	Legal; patents; trademarks	Data communications; data management and database management; engineering and scientific; word processing; text processing; mailing list generator	Administrative systems; financial services; data management and database management; data communications; engineering and scientific; facility design and management; purchasing management; work force management
President	Richard J. Walters	Peter J. McAteer	Schumann Rafizadeh	P.D. Scholten
Director of marketing	Kimberly Bruce	Ronald C. Knudson	Michael Drapp	J.M. Ross
Date founded	1970	1971	1979	1967
No. of employees	4200	28	14; 100 percent devoted to on-line services	Over 300
Rev. last FY	$50M or more	$1.0M-$4.9M	$500K-$999K	
Primary customers	Financial institutions, business related database categories	Legal professionals; corporate and law firms	End users	Telecommunications industry companies
Product line	Provides computing services, applications systems, and professional services to business, industry, and government. Provides applications systems software for manufacturing, financial, engineering, scientific, and general business users. The professional services group provides expertise in technical areas, as well as in functional skills such as manufacturing resource planning.	Provides on-line, interactive software and services related to legal data management, particularly for patent, trademark, and licensing information. Systems operate on IBM PCs, mainframes, and Wang VS computers.	Provides timesharing services. The packages available include engineering systems; software development tools; database management systems; and word, text, and list processing. Also provides educational courses and seminars on database management and software development tools.	Provides information systems for the mechanization and system integration of major telecommunications functions including facilities administration; facilities assignment; customer services; communications and network management; CAD/CAE for telecommunications ISP/OSP engineering and asset management; and work force management. Also provides data processing services.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	McDonnell Douglas Health Systems Company	McDonnell Douglas Physicians Systems	McDonnell Douglas Information Systems Group	McGraw-Hill/Dodge Cost Systems
Address and Phone	600 McDonnell Boulevard Hazelwood, MO 63042 (314) 232-9861	2140 W. 190th Street Torrance, CA 90504 (213) 320-1101	Box 516 St. Louis, MO 63166 (314) 232-9551	1101 State Road, Building D, P.O. Box 28 Princeton, NJ 08540 (609) 426-7300; (800) 257-5295
Subsidiary of	McDonnell Douglas Corp.	—	McDonnell Douglas Corp.	—
Principal business	On-line computer services company; software vendor, selling software for IBM, Digital Equipment Corp., and Tandem processors; database producer; maintenance company	On-line computer service company; computer system manufacturer; maintenance company	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM, Data General, and Digital Equipment Corp. equipment; hardware manufacturer; field service company; consultants; Turnkey CAD/CAM vendor; network vendor	On-line computer service company; off-line computer service company; construction cost data
Applications emphasis	Medical and health care; administrative systems; patient statistics; patient accounting; microbiology systems	Accounting; medical and health care	Accounting; data management and database management; engineering and scientific; government; insurance; management sciences; manufacturing; mathematics and statistics; medical and health care; sales and distribution; transportation; inventory control; order processing	Construction
President	Frank V. Stefanik Jr., Executive Vice President and CEO	—	J.J.Cansby	—
Director of marketing	David M. Rousseau, Vice President, Marketing and Planning	Bill Enoch	W.W. Hudgins	Frank Benz, V.P. and General Manager
Date founded	1970	1969	1960	1950
No. of employees	2,000; 50 percent devoted to on-line services	200; 95 percent devoted to on-line services	12,000	30; 30 percent devoted to on-line services
Rev. last FY	$200M or more; 50 percent from on-line services	—		$1.0M-$4.9M
Primary customers	Health care industry—hospitals, physician offices, clinics, independent laboratories, etc.	Medical groups, clinics, and schools	Health services, telecommunications industry, manufacturing and engineering, financial services	Construction and design industry
Product line	Provides the following services: HFC—shared financial info system; IHS—standalone financial and patient care system; MHS—in-house financial info system; PCS—patient care results reporting system; HDC—patient data communication and collection system; Medical Records System—info abstracting system; PathCom—laboratory info management system; RxCom—pharmacy info management system.	Provides timesharing services. Available applications are in the medical accounting area. Nationwide access is provided.	Provides complete information systems, from hardware and software to field support and networking. Products include Tymnet public and private networks; computer hardware and software; the TeleCheck check acceptance service; EDI*Net, a leading electronic data interchange system; and a wide range of systems in health information, diagnostic services, CAD/CAE/CAM, and applied communications.	Provides timesharing and batch processing services for construction cost estimating. Offers 3 basic systems for construction cost estimating: System 1 for detailed estimating; System 73 for design estimating; and System 90 for budget estimating. A construction materials database and a labor rate database are available. Other products from the company include IBM PC-compatible estimating packages.

Vendor Name	Medical Information Technology, Inc. (MEDITECH)	Meincke, Pearce & Company	Membership Services, Inc. (MSI)	Midwest Commerce Data Corp.
Address and Phone	MEDITECH Circle Westwood, MA 02090 (617) 329-5300	397 Park Avenue, P.O. Box 270 Orange, NJ 07051 (201) 672-8887	2727 Chem Search Blvd Irving, TX 75062 (214) 438-0805	2020 Industrial Parkway Elkhart, IN 46516 (219) 294-6621
Subsidiary of	—	—	National Chemsearch	Midwest Commerce Corp.
Principal business	On-line computer service company; software vendor; facilities manager; maintenance company; consultants	On-line computer service company; off-line computer service company; software vendor, selling software for use with Hewlett-Packard 3000; facilities manager; maintenance company; consultants	Off-line computer service company; software vendor, selling software for use with IBM PCs and compatibles; Texas Instrument 1515; IBM Personal System/2; consultants	On-line computer service company; off-line computer service company; software vendor, selling software for use with Datapoint, IBM 4241; IBM 370/145; NCR 8555; consultants
Applications emphasis	Data management and database management; government; legal; medical and health care; payroll and personnel; sales and distribution; accounting	Accounting; banking and finance; legal	Non-profit services	Accounting; banking and finance; payroll and personnel; accounts receivable; accounts payable; general ledger; fixed assets; time accounting; country club accounting procedures
President	A. Neil Pappalardo	Arthur Olson	Joe Cleveland	Richard L. Hershberger
Director of marketing	Edward Pisinski	Peter Larina	Laura Spencer	Najeeb A. Khan
Date founded	1969	1978	1968	1970
No. of employees	315	—	100; 25 percent devoted to on-line services	150; 30 percent devoted to on-line services
Rev. last FY	$20M-$50M; 33 percent from on-line services	$600K	—	$1.0M-$4.9M
Primary customers	Hospitals, clinics, commercial medical laboratories, state government, health maintenance organizations	Financial institutions, legal corporations	Churches	Banks, savings and loans, manufacturers, distributors
Product line	Sells software to medical and commercial markets worldwide. System software and application software modules are sold to hospitals for ancillary, financial and hospital information systems. Service options include: 1) timesharing, 2) facilities management, 3) rental, and 4) licensing or outright purchasing using Digital Equipment Corp. and Data General hardware. Output includes hard copy and microfiche.	Provides on-line access to customized applications for banks, financial, legal, and professional institutions. The legal and professional applications perform calendar tracking, billing, and timekeeping with an integrated general ledger. In addition, the company offers consulting and programming support for all products.	Provides data processing products, services, and consulting to churches and other nonprofit organizations. Service bureau operations and in-house minicomputer and microcomputer systems are sold nationwide with 1,100 customers in 43 states.	Provides dedicated on-line and batch services. On-line financial services are provided for savings and loan associations. Batch processing includes payroll, accounts receivable, accounts payable, general ledger, fixed assets, professional time accounting, and country club billing. Hard copy, microfilm and microfiche output are available. Sells Datapoint computers with applications software.

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COMPANY PROFILES

Vendor Name	Midwest Data Systems, Inc.	Mini-Probe Corp.	MJK Associates	Modern Language Association of America
Address and Phone	1 Insurance Square Celina, OH 45822 (419) 586-5181	66-05 Woodhaven Boulevard Rego Park, NY 11374 (212) 830-0110	122 Saratoga Avenue, Suite 11 Santa Clara, CA 95051 (408) 247-5102	10 Astor Place New York, NY 10003 (212) 475-9500
Subsidiary of	Celina Financial Corp.	—	—	—
Principal business	On-line computer service company; software vendor; facilities manager; maintenance company	On-line computer service company; software vendor; facilities manager; turnkey systems vendor	On-line computer service company; database producer; off-line computer service company	On-line computer service company; database producer; membership organization; publisher
Applications emphasis	Insurance	Accounting; manufacturing; sales and distribution; inventory control; accounts receivable; accounts payable; general ledger; order processing; sales analysis; billing/invoicing/collection	Banking and finance; investment analysis; commodities	Humanities
President	Martin A. Herf	George O'Malley	Susan T. Held	Phyllis Franklin, Executive Director
Director of marketing	—	Patrick Leech	Michael A. Marriott	Judith Altreuter, Production Manager
Date founded	—	1971	1972	1883
No. of employees	85	14; 100 percent devoted to on-line services	8; 75 percent devoted to on-line services	60; 33 percent devoted to on-line services
Rev. last FY	$7M	$1.0M-$4.9M; 90 percent from on-line services	$500K-999K	$1.0M-$4.9M; 33 percent from on-line services
Primary customers	Insurance companies and agents	Giftware importers, paper and stationary suppliers, cosmetic industry, chemical industry, garment industry	Commodity brokers, individual speculators, and financial advisors	Research libraries
Product line	Provides timesharing services for property and casualty insurance companies. Offers applications for policy processing. Also provides annual reporting services and will file the insurance companies accounting statistics with any reporting bureau.	Provides fixed-priced timesharing and services. Specialization areas include special custom pricing and inventory control applications for giftware importers, paper and stationary suppliers, and cosmetic and chemical companies. Applications are also available for accounts receivable, accounts payable, general ledger, order entry, invoicing, inventory control, garment billing, and sales analysis.	Produces a commodity data information service (CDIS), which provides daily commodity contract and currency futures for 65 major commodities. The open, high, low, close (settling), volume, open interest plus cash and selected indices are available. Users can obtain such information as spreadsheets, bar graphs, and moving averages. Software packages and a data retrieval service are available.	Produces the Modern Language Association of America database. Regular publications include MLA International Bibliography (in print and on-line), MLA Directory of Periodicals, PMLA, and MLA Newsletter. MLA also provides computer services to other scholarly societies. Services include text processing, membership files, accounting files, etc.

Vendor Name	Money Management Systems, Inc.	Mountain West Research Southwest, Inc.	MRCB Service Bureau	Muller Data Corp.
Address and Phone	303 Wyman Street Waltham, MA 02154 (617) 890-2070	432 N. 44th Street, Suite 400 Phoenix, AZ 85008 (602) 273-1088	11633 Victory Boulevard North Hollywood, CA 91609 (818) 509-1790	111 Broadway New York, NY 10006 (212) 766-9555
Subsidiary of	Strategic Information	—	—	Muller & Company
Principal business	Remote timesharing services to the financial community; software vendor, selling MoneyMarket II for use on in-house Digital Equipment Corp. VAX computers	On-line computer service company; real estate consulting; information products	On-line services company; database producer; off-line computer services company; software vendor-IBM large mainframes under MVS and DOS/VSE; facilities manager; consulting, programming, and fulfillment	On-line computer service company; database producer
Applications emphasis	Banking and finance; investment analysis	Data management and database management; management sciences; graphics; financial and statistical time series; real estate management	Data communications; data management and database management; education	Banking and finance; securities; stock information; bonds
President	W. Benton Jones	—	Richard Yung	George Prefer
Director of marketing	Robert E. Leahy	—	Jim Case, V.P. of Marketing	—
Date founded	1976	1982	1978	—
No. of employees	10; 40 percent devoted to on-line services	66	250; 40 percent devoted to on-line services	50
Rev. last FY	$1.0M-$4.9M; 50 percent from on-line services	—	$10M-$19M; 100 percent derived from computer services	—
Primary customers	Commercial banks, financial institutions	End users in the public and private sector	End users	—
Product line	Provides processing through remote timesharing and turnkey in-house computer systems. MoneyMarket II software provides support for the processing and management of trading, portfolio, safekeeping, and clearance activities of commercial banks and financial institutions as well as on-line information to traders and salespeople on positions, collateral, and customer activity.	Provides timesharing services through their Tempe, AZ computer center. The four major application areas are database management, statistical analysis, modeling systems, and graphics. The company also provides commercial and residential databases on demographic and economic real estate in the Phoenix metropolitan area.	Provides on-line processing, timesharing services, DBMS, IDMS new product development, batch processing, consulting/programming services, IDMS education, remote job entry, laser printing, customized applications and systems software, a complete enhancement software product line, on-site and off-site professional IDMS education, and IDMS timesharing services.	Provides municipal bonds evaluation services, on-line or batch; corporate stock and bond price dividends, via remote transmission or batch; dividend announcements services, mortgage-backed securities, prices and factors; international securities, and registered bond services, via remote transmission or batch.

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COMPANY PROFILES

Vendor Name	Multinational Computer Models, Inc.	B.J. Murray, Inc.	National Computer Network Corporation	National Computer Systems
Address and Phone	605 Bloomfield Avenue Montclair, NJ 07042 (201) 746-5060	140 Sylvan Avenue Suite 6 Englewood Cliffs, NJ 07632 (201) 585-2970	175 W. Jackson - A1038 Chicago, IL 60604 (312) 427-5125	Highway 1 & Interstate 80 Iowa City, IA 52244 (319) 354-9200
Subsidiary of	—	—	—	Westinghouse Electric Corp.
Principal business	Database producer; software vendor, selling software for use with IBM PCs interacting with mainframes, international financial consultants	On-line services company; software vendor	On-line computer service company; database producer; off-line computer service company; consultants	On-line computer service company; off-line computer service company; software vendor; facilities manager
Applications emphasis	Banking and finance; data management and database management; economics—international	Accounting; property management	Banking and finance; data communications; data management and database management; engineering and scientific; management sciences; mathematics and statistics; transportation; commodities; inventory control; securities; investor relations	Accounting; education; government; payroll and personnel; accounts receivable; accounts payable; student related information
President	Abraham M. George	Brian J. Murray	James Leopold	Donald J. Gibson
Director of marketing	Dirck Snyder	Frank DeLucia	—	Joseph W. Nelson
Date founded	1975	1978	1969	1953
No. of employees	18; 70 percent devoted to on-line services	25; 100 percent devoted to on-line services	18; 100 percent devoted to on-line services	800; 50 percent devoted to on-line services
Rev. last FY	$500K-$999K; 70 percent from on-line services	$1.0M-$4.9M; 100 percent from computer services	—	$20M-$50M; 100 percent from on-line services
Primary customers	Multinational corporations; banks; international financial institutions	Property managers	Brokers, banks, researchers, money managers, investment advisors	Educational institutions, commercial industrial users, state/local/federal government
Product line	Provides extensive international financial applications and financial and economic databases. Primary emphasis of information services are country and currency risk, governmental policy directions, and macroeconomics. Other services are currency forecasts, macroeconomic forecasts, and software for managing foreign exchange exposures. PC based applications, to interact with mainframes, are currently provided.	Offers on-line services to firms generally managing between 200 and 10,000 commercial or residential units. Services include tenant accounts receivable and accounts payable. Arrears reports and legal actions can also be maintained on the system. PMS, the name of the on-line system, also processes checks and journal entries for general ledger and financial statements, and produces rent invoices.	Provides timesharing services, consulting, and customized programs. Applications include: marketing forecasts, stock option analysis, stock and portfolio pricing, microcomputer programming, futures commodities analysis, CD rates, bank performance data, and plotting and graphics. The company also offers access to financial databases.	Produces software. Areas of expertise include: payroll, personnel, financial management, financial accounting, financial aid management, accounts receivable, accounts payable, and student records, grades, attendance, loans, admissions, and alumni. The company also sells computer time for on-line and batch processing and develops administrative software systems for small and medium-sized colleges.

Vendor Name	National Data Services, Inc.	National Decision Systems, Inc. (NDS)	National Information Systems, Inc.	National Planning Data Corp. (NPDC)
Address and Phone	21835 Nordhoff Street Chatsworth, CA 91311 (818) 882-7360	539 Encinitas Boulevard Encinitas, CA 92024 (619) 942-7000; (800) 882-6200	1190 Saratoga Avenue San Jose, CA 95129 (408) 985-7100	P.O. Box 610 Ithaca, NY 14851 (607) 273-8208
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; database producer; off-line computer service company	On-line computer service company; software vendor; facilities manager	On-line computer services company; database producer; off-line computer services company; software vendor
Applications emphasis	Accounting; legal; manufacturing; payroll and personnel; sales and distribution; general ledger; cost accounting; accounts payable; accounts receivable; fixed assets	Banking and finance; government; management sciences; manufacturing; media; medical and health care; sales and distribution; transportation; real estate management; retail industry information; marketing; insurance	Data management and database management; project management; facility design and management; accounting	Census data; demographics; market research; thematic mapping
President	Charles J. Flynn	H. Michael Stansbury	Arden P. Scott	Douglas C. Salter
Director of marketing	Marlene Robison	Craig Curtner, Director of Corporate Relations	Bill Mulert	James D. Spear, Vice President, Sales and Marketing
Date founded	1963	1978	1972	1969
No. of employees	30	110; 100 percent devoted to on-line services	30; 20 percent devoted to on-line services	75; 15 percent devoted to on-line services
Rev. last FY	—	$10M-$19M	—	
Primary customers	General business, accountants, manufacturers, distribution companies, political organizations	Real estate, marketing, advertising, financial institutions, retail, insurance brokers, media	Aerospace companies, financial institutions, electronics	Market researchers and those performing site location analysis
Product line	Offers batch and remote job entry processing through its service bureau operation. Available packages include general ledger, payroll, job cost, accounts payable, accounts receivable, and fixed assets. Provides customized programming to user specifications for in-house processing and Datapoint computers.	Provides demographic and marketing info with reports, models, and analytical tools. NDS's demographic reports include 1980 census data, current year estimates, and 5 year projections. Clients can customize their reports by selecting specific demographic characteristics. Also offers models and analytical tools to assist clients in analyzing and applying demographic data to evaluate sites and forecast sales success.	Offers timesharing services to the Western United States and other areas of the U.S. via Tymnet. Areas of specialization include data management and modeling applications. Packaged software products include Accent R, DBMS, 4th GL, and VUE project management.	Creates demographic estimates and projections and processes census and other demographic data. Annually, NPDC produces its UPDATES series of current estimates and five-year projections of key demographics such as population, age, and income. In addition, NPDC maintains an extensive collection of tapes from the 1980 Census, and provides custom extracts and processing.

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COMPANY PROFILES

Vendor Name	National Time Sharing and Data Services, Inc.	NCR Data Services Division	Network Associates	Network Computing Corp.
Address and Phone	1342 Military Road Niagara Falls, NY 14304 (716) 297-0553; (800) 255-0670	1700 S. Patterson Boulevard Dayton, OH 45479 (513) 445-4600	200 Fifth Ave. S.E., P.O. Box 4828 Cedar Rapids, IA 52407 (319) 398-1800	5301 77 Center Drive Charlotte, NC 28217-2703 (704) 525-8810
Subsidiary of	Conbow Corp.	NCR Corp.	—	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; off-line computer service company; facilities manager; electronic funds transfer network services company; COM processing services company	On-line computer service company; software vendor, selling software for use with Data General MV 15000 series; IBM 30XX, 43XX	On-line computer service company; software vendor; turnkey systems
Applications emphasis	Accounting; government; manufacturing; payroll and personnel; general ledger; accounts receivable; accounts payable; inventory control; billing/invoicing/collection; municipal accounting procedures	Banking and finance; retail trade data; accounts receivable; accounts payable; financial reporting	Insurance	Accounting; data management and database management; utility management; billing/invoicing/collection; accounts payable; general ledger; budget systems; labor force information; inventory control; job cost accounting; financial services
President	Dr. Charles G. DeWald	J.D. Wise, Assistant Vice President	John D. Ballard	James V. Tomai
Director of marketing	Bruce Cowe, Executive V.P.	D.R. Burns	Larry J. Doze	Keith M. Eades
Date founded	1968	—	1956	1971
No. of employees	65; 20 percent devoted to on-line services	1,000	70; 90 percent devoted to on-line services	—
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	—	—	—
Primary customers	Membership billings, manufacturing, government	Thrift institutions, commercial banks, retail stores	Life and health insurance companies	Utilities and municipalities
Product line	Provides timesharing, retail applications, contract programming, municipal and manufacturing MIS, voter registration, data entry, consulting services, list management, doner tracking, and laser and impact printing. Available applications include general ledger, accounts receivable and payable, inventory control, product costing, municipal accounting, billing, invoicing, and production scheduling.	Provides on-line services to thrift institutions, commercial banks, and retail stores. Provides real-time account processing and a complete management information system. Also offers account processing and reporting through an integrated database. Also provides a management information system consisting of merchandise planning, inventory management, accounts payable and receivable, and financial reporting.	Provides on-line and batch computer processing for new and established individual life and health insurance companies. The system includes on-line entry of new, changed, or terminated policy information; maint. of accounting journals, product portfolios, and agent info. Performs administrative functions; such as updating policy and accounting history files, and generating policy reports.	Provides utility billing and consumer information management systems for electric, water, wastewater, refuse collection, and gas utilities. The company also provides over-the-counter cash collection systems; postal discount (ZIP+4) software; and financial systems, including general ledger/accounts, payable/budgeting, payroll, materials inventory/work order, accounting, and property records (electric).

Vendor Name	News-a-tron Corp.	Noesis Computing Company	Norsk senter for informatikk (NSI)	Northwest Management Services, Inc.
Address and Phone	One Peabody Street Salem, MA 01970 (617) 744-4744	615 Third Street San Francisco, CA 94107 (415) 495-7440	Brobekkvn, 80 Postboks 1156, Sentrum 0107 Oslo, Norway (02) 64 08 88	2323 Eastlake Avenue, East Seattle, WA 98102 (206) 329-9990
Subsidiary of	—	—	—	Northwest Administrators, Inc.
Principal business	On-line computer services company; database producer	On-line computer service company; software vendor, selling software for use with Hewlett-Packard 3000	On-line computer services company; database producer; off-line computer services company; software vendor	On-line computer service company; off-line computer service company
Applications emphasis	Banking and finance; stock information	Accounting; order processing; membership management systems	Banking and finance; education; engineering and scientific; government	Accounting; banking and finance; pension services; union accounting services
President	Louis G. Rossi	Robert V. Scavullo	Hans Kristian Krogh	R.G. Dawson, Chief Operating Officer
Director of marketing	—	Robert V. Scavullo	Odd Haugsteit	—
Date founded	1980	1976	1944	1967
No. of employees	7; 100 percent devoted to on-line services	12; 50 percent devoted to on-line services	35; 10 percent devoted to on-line services	70; 100 percent devoted to on-line services
Rev. last FY	$200K-$499K	$1.0M-$4.9M; 60 percent from on-line services	$1.0M-$4.9M; 90 percent from on-line services	—
Primary customers	Semiprofessionals, consumers, and end users	Trade associations	Norwegian industry	Health and welfare pension administrators, savings and loans, unions
Product line	Provides authoritative news and analytical features on the commodity and financial markets. Among the company's products are News-a-tron Market Reports, which provide a timely interpretation and analysis of the fundamental news stories and technical factors that influence the marketplace.	Provides an on-line service bureau offering Powerhouse, Fourth Generation DBMS, Multiview Accounting, and DSG/3000 Graphics. Clients access via CRT terminals and personal computers.	Offers 11 publicly available on-line databases. A search system developed by the company called Polydoc, is part of a software package for data entry, storage, and retrieval of information. Nine of the 11 databases contain bibliographic information. A computer-based course program provides instruction in the searching of the databases.	Provides on-line banking services for 30 Savings and Loans in 5 western states. On-line membership updating and accounting services for 10 unions in 3 states. Pension, health, and welfare accounting services for Northwest Administrators.

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COMPANY PROFILES

Vendor Name	Numerax Inc.	OCLC Online Computer Library Center, Inc.	On-Line Business Systems, Inc.	On-Line Computer Systems, Inc.
Address and Phone	230 West Passaic Street Maywood, NJ 07607 (201) 368-0170	6565 Frantz Road Dublin, OH 43017 (614) 764-6000; (800) 848-5878	115 Sansome Street San Francisco, CA 94104 (415) 391-9555	660 Newport Center Drive Newport Beach, CA 92660 (714) 644-1801
Subsidiary of	McGraw-Hill	—	—	—
Principal business	On-line computer service company	On-line computer service company	Remote computing services; custom software development; software sales	On-line computer service company
Applications emphasis	Transportation	Library information systems	Data management and database management; engineering and scientific; management sciences; manufacturing; sales and distribution; insurance; petroleum; securities; oil and gas acctg. procedures; facility design and management; software development; data comm.	Banking and finance; general ledger; accounts payable; mortgage information; time accounting; individual retirement account processing
President	Keith Keenan	Rowland C. W. Brown	Jeffery D. Stein	Ray Wells
Director of marketing	Frank Dellarosa, V.P. of Sales	Kenneth Harris, Vice President Marketing and User Services	Thomas E. Cohan, Vice President	—
Date founded	1969	1967	1969	1968
No. of employees	300	500; 100 percent devoted to on-line services	Over 200	—
Rev. last FY	Over $10M; 50 percent from on-line services	$20M-$50M; 100 percent from on-line services	$20M-$50M; 90 percent from on-line services	—
Primary customers	Shippers and receivers of goods; motor carriers	Libraries	End users	Banks, savings & loans, thrift & loans, financial institutions
Product line	Provides on-line and batch processing services to companies incurring freight expenses. Numerax offers access to databases comprised of general and client specific freight rate information. The available applications include freight rating, auditing, payment, and transportation reporting from a history file which is client oriented. The company also offers tariff building to the motor carrier industry.	Operates an international computer network used by libraries to acquire and catalog library materials, order custom-printed catalog cards, produce machine-readable bibliographic records, arrange interlibrary loans, and maintain local information on library material. A nonprofit computer library service and research organization whose principal businesses are providing centralized and local turnkey systems to libraries.	Provides timesharing and remote batch processing with access to transaction processing and database management tools. Also develops and processes custom-tailored on-line applications and provides program software. Custom systems include: hotel and tour reservations; on-line distribution; financial lease management; general processing; stock option trading; and off-site facilities management.	Provides real-time services to financial institutions in the Western United States. Available systems include demand deposit accounting, time deposit accounting, certificate of deposit, individual retirement accounts, commercial loans, consumer loan, leases, floor plan, general ledger, accounts payable, mortgage loans, central information file, and collection management system.

Vendor Name	On-Line Research, Inc.	Online Resource Exchange, Inc.	PCS Data Processing, Inc.	Photo Data, Inc.
Address and Phone	200 Railroad Avenue Greenwich, CT 06830 (203) 661-1395	601 Poydras Street, Suite 2011, Box 48 New Orleans, LA 70130 (504) 581-1806	140 Cedar Street New York, NY 10006 (212) 964-4646	923 Lewis Rockville, MD 20851 (301) 770-0440
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; software vendor	On-line services company; database producer; off-line services company	On-line computer service company; off-line computer service company; facilities manager; consultants	On-line computer service company
Applications emphasis	Direct mail; tax related information; real estate management	Oil and gas exploration	Accounting; sales and distribution; order processing; inventory control; sales analysis; tax calculation/budgeting/processing	Media; typesetting
President	Frank E. Wolf	Max E. Maxwell	Stanley Berger	F. Scott Watkins
Director of marketing	Sandra Lance	Robert H. McCullough Jr.	Bert Rodd	Anthony Fazio
Date founded	1978	1984	1955	1958
No. of employees	—	8; 100 percent devoted to on-line services	55; 100 percent devoted to on-line services	28; 60 percent devoted to on-line services
Rev. last FY	$200K-$499K	—	$1.0M-$4.9M; 100 percent from on-line services	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	—	Major and independent oil companies	Book publishing companies	U.S. Government, McGraw-Hill
Product line	Provides timesharing, software development databases, U.S. Census of Agriculture, Frost & Sullivan Research Report Abstracts, sales analysis, direct mail marketing, merge/purge, name and address processing, electronic newsletters, data entry services, service bureau functions, inventory and mail order fulfillment, commercial real estate data services, and software development.	Operates the Exchange, a database accessed directly by buyers and sellers of producing oil and gas properties. Sellers can list entire data packages of their sale property from their office. Buyers can search the database for properties that meet their acquisition criteria. In addition to providing the information, the Exchange assists in gathering engineering, geologic, and land data that may be required.	Offers on-line and batch processing services. The company provides a daily processing package for the book publishing industry. Available applications include order processing, inventory, sales analysis, accounting, royalties, back order, selection, list maintenance, and taxes. Also offers stand-alone applications which include accounts receivable and payable, and general ledger/financial reporting.	Provides on-line services to publishers which include computerized typesetting and data conversion services for database publications. Photo Data also provides word processing interface programs to many different systems through magnetic tape medium.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Photonet Computer Corporation	Planning Research Corp. (PRC)	Polycom Systems Ltd.	PolySystems, Inc.
Address and Phone	1001 South Bayshore Drive Miami, FL 33131 (305) 374-0074; (800)-FOTONET	1500 Planning Research Drive McLean, VA 22101 (703) 556-1000	90 Nolan Court, Unit 50 Markham L3R 4L9, Canada (416) 449-3400	55 E. Jackson Boulevard Chicago, IL 60604 (312) 663-5670
Subsidiary of	—	—	—	—
Principal business	On-line computer services company; database producer	On-line computer service company; off-line computer service company; facilities manager	On-line computer service company; database producer; software vendor, selling software for use with Honeywell DPS8; Digital Equipment Corp. VAX; IBM 9370 series; facilities manager	On-line services company; software vendor
Applications emphasis	Media; advertising; publishing industry services	Data management and database management; engineering and scientific; government; mathematics and statistics; medical and health care; business related database categories; membership management systems	Data management and database management; insurance; financial management; investment reporting	Insurance
President	Patricia Woodson	Wayne Shelton	R. Drury; CEO	L.W. Schmitz
Director of marketing	Len Kaltman	Paul O'Brien	A. Francescut	Roger W. Smith
Date founded	1983	1968	1968	1970
No. of employees	6	2,000; 10 percent devoted to on-line services	70; 80 percent devoted to on-line services	15; 80 percent devoted to on-line services
Rev. last FY	$200K-$499K; 100 percent derived from on-line services	—	$5.0M-$9.9M; 80 percent from on-line services	—
Primary customers	Publishers; photographers; picture libraries	Associations, private industry	End users	Life insurance companies
Product line	A research and communications network for stock photography. Editors, photo researchers, and other photo buyers are able to send photo requests on-line to any of the 35 major picture agencies or hundreds of professional photographers. Specialized databases list travel itineraries of leading photojournalists, and listings of newly available photographs.	Provides on-line, timesharing, and batch processing services. Available applications include database management systems, membership database management, statistical reporting, and convalescent home data management.	Provides services ranging from stock market applications to providing nationwide access to strategic corporate information. Computing services include an on-line interactive service, remote batch services, and "over-the-counter" batch services for clients who wish to schedule jobs for intermittent processing. Also available is an international network service which is accessible by telephone.	Specializes in software and computer services for the life insurance company actuary.

Vendor Name	Power Computing, Inc. (PCC)	Prodata System, Inc.	Professional Hospital Services	Profitool, Inc.
Address and Phone	1930 Hi Line Drive Dallas, TX 75207 (214) 655-8694	2333 Western Avenue Seattle, WA 98121 (206) 441-4090	12960 Coral Tree Place Los Angeles, CA 90066 (213) 822-2505	1600 Stout St., Suite 1000 Denver, CO 80202-3135 (303) 571-1555
Subsidiary of	Babcock & Wilcox	—	American Medical International	—
Principal business	On-line computer service company	On-line computer service company; off-line computer service company	On-line computer service company; distributive processing	On-line computer service company; turnkey system vendor, selling software and Prime Computer 50 series minicomputers
Applications emphasis	Nuclear related information; energy; utility management; government	Accounts receivable; medical and health care; dental care	Accounting; data communications; medical and health care; payroll and personnel	Construction; accounts receivable; accounts payable; general ledger; cost accounting; cost estimating systems; payroll and personnel; purchasing management
President	—	Robert Foster	Revell B. Lamprecht	Gary M. Tamblyn
Director of marketing	—	Andy Schellhas; Executive V.P. of Marketing	—	Tom Levandoski
Date founded	—	1958	1977	1977
No. of employees	—	49; 50 percent devoted to on-line services	125; 100 percent devoted to on-line services	17; 20 percent devoted to on-line services
Rev. last FY	—	—	—	$1.0M-$4.9M; 30 percent from on-line services
Primary customers	—	Health care providers	Hospitals	Construction companies
Product line	Provides computing services to utilities and energy industry members, as well as others. These services range from designing and implementing utility management systems to processing structural design problems and providing micro-mainframe computer database systems. PCC also offers a broad range of applications software packages for use by the electric power industry.	Provides carefree "connected computing" services (COS) based on user installed terminals, printers, and IBM PCs connected on-line to mainframes under CICS. Proprietary software called A/R Easy On-Line is used for medical and dental health care clients, with over ten years development and over 500 users. Also provides network processing of multi-branch inventory for Northwest distributors.	Offers distributive processing services for hospital financial systems and patient care info systems. The hospital financial system includes inventory, patient accounting, general ledger, financial reporting, payroll, labor management, personnel, and accounts payable. The patient care systems include service ordering; results reporting; admission, discharge, and transfer information; and general message switching.	Provides data processing services to the construction industry. CMIS is a transaction processing software product, capable of providing real-time information to all levels of construction management. CMIS includes integrated modules for processing payroll, accounts receivable and payable, purchasing, billing, subcontractor control, report writer, equipment cost, general ledger, and job cost.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Programs & Analysis, Inc.	Progressive Management Services, Inc. (PMS)	Proprietary Computer Systems, Inc. (PCS)	Quantum Computer Services, Inc.
Address and Phone	21 Ray Avenue Burlington, MA 01803 (617) 272-7723	2828 Anthony Lane South Minneapolis, MN 55418 (612) 781-6521	16625 Saticoy Street Van Nuys, CA 91406 (818) 781-8221	8619 Westwood Center Drive Vienna, VA 22180 (703) 448-8700
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP/11 and VAX; consultants	On-line computer service company; software vendor	On-line services company; database producer; software vendor—Commodore 64 and 128
Applications emphasis	Accounting; banking and finance; data management and database management; education; government; medical and health care; sales and distribution; sales analysis; trade union management; textiles; apparel related industry	Accounting; manufacturing; sales and distribution; library information systems; inventory control; retail trade data; non-profit services	Accounting; banking and finance; report writer; investment reporting; payroll and personnel; construction; real estate management	General interest database categories; news summaries
President	Paul J. Brighton	Jerry Miller	Bill Barancik	James V. Kimsey
Director of marketing	—	Tom Youngquist	Roni Itagaki	Stephen M. Case, V.P. of Marketing
Date founded	1968	1972	—	1985
No. of employees	120	12; 95 percent devoted to on-line services	100	70; 100 percent devoted to on-line services
Rev. last FY	$5.0M-$9.9M	$20M; 100 percent from on-line services	—	—
Primary customers	Cross-industry	Educational institutions, retail/distribution organizations, professional services, manufacturing companies	Cross-country	Commodore 64/128 users
Product line	Provides timesharing, remote batch, batch processing, and data entry. The Doc-Bill Division provides data processing services to the medical profession. An integrated administrative system is offered through the Educators Consultant Service. Municipal Services Division offers tax billing. Other divisions include Programming and Consulting Services Division, Union Division, and Professional Health Systems.	Provides on-line timesharing services through a service bureau environment. Offers batch and distributive processing services on a limited basis. PMS offers customer training and consulting services at the clients' sites. Their specialization lies primarily in the areas of wholesale/retail distribution, manufacturing, inventory control, colleges and education, non-profit organizations, and professional services.	Offers financial applications for trust accounting, investment management, and real estate via timesharing, remote batch, batch processing services, and technical publishing services. The company sells and leases its own proprietary software and is converting many of its packages to run on microcomputers.	Provides an on-line service to Commodore 64/128 owners. The service, called QuantumLink, includes news and information, a learning center, shopping center, real-time chat, full color interactive games, software catalog previews, and the Commodore Information Network.

Vendor Name	Rapid Data, Inc.	Real Estate Information Network	Republic Service Bureau, Inc.	Retrieval Systems Associates, Inc.
Address and Phone	215 North 5th Street Redlands, CA 92374 (714) 793-2855	127 South Broadway P.O. Box 108 Nyack, NY 10960 (914) 358-2335	19110 Van Ness Avenue Torrance, CA 90501 (213) 533-0211	4124-M Walney Road Chantilly, VA 22021 (703) 631-8622
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor; facilities manager; minicomputer turnkey systems	On-line computer services company; database producer; software vendor; computer system manufacturer; maintenance company	On-line computer service company; off-line computer service company; software vendor, selling software for use with IBM 360/370/43XX	On-line service company; software vendor
Applications emphasis	Accounting; banking and finance; government; manufacturing; medical and health care; payroll and personnel; sales and distribution; transportation	Accounting; banking and finance; data communications; government; insurance; legal; real estate management; property management; tax related information	Accounting; legal; manufacturing; job cost accounting; payroll and personnel; sales and distribution; accounts payable; general ledger; accounts receivable; cost accounting; fixed assets; sales analysis; property management; billing/invoicing/collection; word processing	Banking and finance; data management and database management; government; legal; media; electronic mail
President	—	James J. Clyde	Jerome A. Sorkin	Jeff Entwisle
Director of marketing	—	John Fasulo	Virginia Northington	—
Date founded	1962	1980	1961	1984
No. of employees	50; 100 percent devoted to on-line services	13; 60 percent devoted to on-line services	125; 60 percent devoted to on-line services	6
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	—	$5.5M-$6.0M; 60 percent from on-line services	$200K-$499K
Primary customers	End users	Real estate brokers; attorneys; accountants; mortgage lenders; appraisers	End user	Companies with Stratus or IBM System 88 computers
Product line	Provides interactive timesharing, batch processing, and in-house turnkey systems. Their area of specialization is customized applications. Develops applications or modifies existing or standard ones to fit specific user needs.	Provides on-line market data, financial data, and software. Markets on-line real estate information that includes current sales significant to market analysis, current and historical financing trends with information on specific lending institutions, leasing terms, income and operating statements, and cap rate studies. This is useful for financing, investment analysis, and property tax equality and assessment appeal.	Provides a batch and on-line accounting system. Applications include accounts payable, general ledger, accounts receivable, job cost, fixed assets, profit and loss, cash flows, property management, sales analysis, billing, and payroll. Available on a multi-company, multi-bank, multi-fiscal year end, and cash and/or accrual basis.	Provides database development software, electronic mail, bulletin boards, conferencing software, and full text retrieval

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Rexnord Data Systems	Reynolds + Reynolds	Ross Systems, Inc.	Rotelcom Corp.
Address and Phone	4701 West Greenfield Avenue Milwaukee, WI 53214 (414) 643-3703	P.O. Box 1005 Dayton, OH 45401 (513) 443-2000	1860 Embarcadero Road, Suite 208 Palo Alto, CA 94303 (415) 856-1100	930 Fairport Industrial Park Fairport, NY 14450 (716) 381-3090
Subsidiary of	Rexnord, Inc.	—	ROSSDATA Corp.	Rochester Telephone Corp.
Principal business	On-line computer service company; software vendor, selling software for use with IBM OS MVS; facilities manager; computer system manufacturer	In-house computer service company; off-line computer service company; software vendor	Software vendor, selling accounting and financial software for use with Digital Equipment Corp. VAX; on-line computer service company; consultants, custom applications; training	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11 and VAX; consultants
Applications emphasis	Management sciences; sales and distribution; management sciences; sales and distribution; facility design and management	Business related database categories; automotive	Banking and finance; accounting; management sciences; financial planning; financial reporting	Data communications; data management and database management; legal; inventory control; budget systems; telecommunications; billing/invoicing/collection; telephone industry services
President	Don Taylor	Terry D. Carder	Kenneth Ross, Chief Executive Officer	James C. Henderson
Director of marketing	Leon Todd	Jack Proud	James Goetsch, V.P. of Marketing	Dennis Dundon
Date founded		1866	1972	1980
No. of employees	13,000; 1 percent devoted to on-line services	3,373	120	15; 75 percent devoted to on-line services
Rev. last FY	$50M or more; 1 percent from on-line services	$50M or more; 60 percent from on-line services	—	$1.0M-$4.9M; 60 percent from on-line services
Primary customers	Manufacturing; insurance; computer services	Automobile dealerships	End users	Telephone companies, SMDR cross-industry, resale common carriers
Product line	Offers commercially a Generic Computer Utility (GCU) which is a processing resource under IBM OS/MVS for remote computer processing; on-line timesharing (TSO); overflow processing; and computer systems conversions. Computer related consulting services are also available which include training in the areas of TSO; SPF; IFPS; and FOCUS, as well as project management services.	Provides in-house and off-line services for management system applications used by automobile dealers. Available applications include accounting, parts inventory, payroll, inventory control, sales, and service management. The company also provides a number of applications for motorcycle dealers, truck dealers, and marine dealers. Also provides management systems and accounting services.	Provides interactive timesharing capabilities and overnight batch processing, as well as in-house installation. Services focus on financial and accounting systems. A supplier of financial management software for Digital's VAX minicomputers. The MAPS family of software products integrates accounting applications with decision support tools to address the needs of corporations in many industries.	Provides timesharing and batch processing services through their Fairport data center. On-line applications include budget preparation, telecommunications, litigation, inventory control, and billing. Batch processing offers other services as well; such as, station message detail recording system. The company offers customized programming as well as data communications hardware and services.

Vendor Name	SAGE DATA, Inc.	SARIN S.p.A.	Saskatchewan Computer Utility Corp.	SAZTEC International
Address and Phone	104 Carnegie Center Princeton, NJ 08540 (609) 924-3000	S.S. 148 Pontina Km 29.100 00040 Pomezia, Italia 06 911971; Telex: 616436	1801 Hamilton Street Regina, Saskatchewan, Canada S4P 3V7 (306) 787-3951	27520 Hawthorne Boulevard, Suite 170 Rolling Hills Estates, CA 90274 (213) 544-0337
Subsidiary of	—	—	—	—
Principal business	On-line computer services company; off-line computer services company; database producer; economic and computer education; consulting	On-line service company; database producer	On-line services company; off-line services company; facilities manager	Computer services company
Applications emphasis	Sales and distribution; chemicals; chemistry related information; macroeconomics	Data management and database management; manufacturing; mathematics and statistics; media; sales and distribution; advertising; travel guide information	Accounting; data management and database management; government; payroll and personnel	Data management and database management; legal; media; medical and health care; telephone industry services
President	Philip S. Abrams	Claudio Rovai	Gerald B. Thom	Thomas L. Reed
Director of marketing	Karen E. Potts	—	Gordon E. Luciuk	Hugh J. O'Neill
Date founded	1977	1980	1973	1976
No. of employees	40; 80 percent devoted to on-line services	300	200; 90 percent devoted to on-line services	24; 60 percent devoted to on-line services
Rev. last FY	—	—	$20M-$50M; 97 percent from computer services	$5.0M-$9M; 100 percent from computer services
Primary customers	End users, chemical industry	—	End users in public corporations and government departments	Contact vendor
Product line	Provides macroeconomic and chemical industry data for the business analyst. This information includes: production, capacity, price, and import and export data on thousands of commodities. In addition, SAGE DATA offers its expertise in the areas of market and strategic planning, computer applications, education, and general econometric analysis.	Producers of the Italian Electronic Yellow Pages (PGE). The database contains information for over 800,000 Italian companies.	Provides data processing services to the government, industry, and institutions. The company services include on-line processing of user applications; datacomm services; timesharing; remote and batch processing; access to database management systems; access to a variety of software products; consulting and customer support services; and education and training services.	Provides full support, or enhanced support, and capacity to clients requiring computer services related to the automation of information. This includes consulting, systems design, input spec development, microfilming, clerical support, programming, processing, data conversion, and technical support.

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COMPANY PROFILES

Vendor Name	SBD Computer Services Corp.	Scicom Data Services Ltd.	Scicon Ltd.	Scientific Computer Applications, Inc.
Address and Phone	4744 Baltimore Avenue Hyattsville, MD 20781 (301) 864-9200	10101 Bren Road East Minnetonka, MN 55343 (612) 933-4200	Wavendon Tower Wavendon, Milton Keynes MK178LX England 0908 585858	403 South Cheyenne, Penthouse Suite Tulsa, OK 74103 (918) 584-6197
Subsidiary of	—	—	British Petroleum	—
Principal business	On-line computer service company; off-line computer service company	On-line computer service company	On-line computer services company; facilities manager; consultants in all aspects of computing	On-line computer service company; microcomputer software vendor
Applications emphasis	Payroll and personnel; pension services	Insurance; manufacturing; payroll and personnel; direct mail; distribution accounting; financial services	Banking and finance; data communications; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; transportation	Engineering and scientific; geology
President	John J. Starzec	Richard A. Walter	Warren Werblow, Chief Executive	Richard B. Banks
Director of marketing	—	Edward L. Vick, Vice President	Rasy Waite	Paul A. Swanson
Date founded	1973	1959	1960	1969
No. of employees	80; 25 percent devoted to on-line services	225	1,120; 15 percent devoted to on-line services	8; 25 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	—	$50M or more; 100 percent from on-line services	$200K-$499K; 10 percent from on-line services
Primary customers	Pension funds	Insurance, manufacturing, trade, direct mail	End users and research librarians	Oil/gas companies
Product line	Provides service bureau support to pension funds for industry, government, and private institutions. Specialized services include collection, reduction, processing, and dissemination.	Provides network information services to businesses throughout the US. Offers conventional and computerized photocomposition, printing, and mailing services; along with batch and data entry services to Upper Midwest customers. On-line applications are currently used by manufacturing, distribution, retailing, insurance, and direct mail firms.	Provides general on-line services, using appropriate packages or systems specially designed for the client. Database services including Viewdata (a videotex service) comprise: development and processing of private or closed user group databases, and public access databases on various aspects of public affairs.	Markets software packages including Mapping-Contouring System (MCS), a contouring system which is available for in-house installation or through General Electric Time-Sharing Information Services Company. MCS is used for contouring data for exploration work, radiation data, weather information, etc. The modular package also includes structure maps, isopachs, and multi-surface faulting.

Vendor Name	Scientific Information Services	Scientific Process & Research, Inc.	SDK Healthcare Information Systems	Seafirst Computer Services
Address and Phone	2525 Washington Kansas City, MO 64108 (816) 221-9700	67 Veronica Avenue Somerset, NJ 08873 (201) 846-3477	1550 Soldiers Field Road Boston, MA 02135 (617) 783-7351	13028 Interurban Avenue, South Seattle, WA 98168 (206) 583-6606
Subsidiary of	Control Data Corp.	—	—	Seattle First National Bank
Principal business	On-line computer service company; professional services	On-line computer service company	Hospital information systems	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11/VAX
Applications emphasis	Accounting; data communications; data management and database management; engineering and scientific; manufacturing; mathematics and statistics; payroll and personnel	Engineering and scientific; research and technology transfer	Medical and health care	Accounting; data management and database management
President	—	Dr. I. Klein	S. David Kaufman	Jack R. Olson
Director of marketing	—	Ron Klein	Michael Kaufman, Executive Vice President	Michael B. Claggett
Date founded	1967	1968	1961	1971
No. of employees	750; 100 percent devoted to on-line services	25; 25 percent devoted to on-line services	—	150; 5 percent devoted to on-line services
Rev. last FY	—	—	—	$5.0M-$9.9M; 100 percent from on-line services
Primary customers	Architectural, engineering and consulting firms, manufacturing, utilities	Plastics industry	Hospitals, health maintenance organizations, physicians groups, community health centers	End users
Product line	Provides remote computing services and custom development to business and industries. The company offers a "total solution" approach to its clients. With national data centers in Kansas City, MO and Pittsburgh, PA, and field offices coast to coast, SIS combines advanced hardware and software facilities, skilled support and programming services, and industry expertise.	Provides on-line access to computerized analysis of research and development data. Information is available to research laboratories, such as chemical, pharmaceutical, cosmetics, plastics, and rubber compounding. The client accesses and enters data through in-office terminals. The company also offers computerized equipment design, diagnostic services, and consulting services for the plastics industry.	Provides a totally integrated hospital information system designed in a modular framework. SDK provides turnkey systems or on-line and off-line processing through their service bureau facility. Available applications include full financial systems, laboratory, pharmacy, radiology, patient registration, medical records, appointment scheduling, report writing tools, and nurse management.	Provides on-line and batch services for financial accounting applications. Services are used by small and medium market customers. The company also offers software for in-house use.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	**Securities and Commodities Corp.**	**Security Pacific Information Services Corp.**	**SEI Corp.**	**Shaker Computer & Management Services, Inc.**
Address and Phone	Box 521 Northport, NY 11768 (516) 757-8638	1401 Del Norte Street Denver, CO 80221 (303) 430-8881	680 E. Swedesford Road, Bldg. #7 Wayne, PA 19087 (215) 687-1700	50 Century Hill Drive Latham, NY 12110 (518) 785-0978
Subsidiary of	—	Security Pacific	—	—
Principal business	On-line computer service company; software vendor selling software for use with IBM PC; TRS-80 Models 1, 2, 3, 4, 12 and 16; Apple 2E, Commodore 64	On-line computer service company; off-line computer service company; facilities manager	On-line computer service company; software vendor; financial product vendor; funds evaluation vendor; consultants	On-line computer service company; off-line computer service company; facilities manager; consultants; software vendor
Applications emphasis	Banking and finance; stock information; securities; commodities	Accounting; banking and finance; data management and database management; insurance	Banking and finance; financial management; investment analysis	Accounting; engineering and scientific; government; legal; payroll and personnel; construction; real estate management; inventory control
President	John M. Lambert	—	Alfred P. West, Jr.	Richard L. Werner
Director of marketing	—	Joseph McClure	—	—
Date founded	1973	1972	1968	1976
No. of employees	6; 100 percent devoted to on-line services	200	1,100	20; 20 percent devoted to on-line services
Rev. last FY	—	—	$50M or more	$1.0M-$4.9M; 100 percent from on-line services
Primary customers	Investors, stock brokers	Commercial banks, savings and loans, mortgage servicers, insurance companies, finance companies	Bank trust departments; bank treasury departments; insurance companies; savings and loan institutions	Municipalities, construction companies, law and accounting firms
Product line	Provides an information service for investors and traders. An on-line database is provided listing over 4,000 stocks, options, and commodities, plus proprietary programs for selecting, evaluating, and timing securities. The system allows user to screen best stocks from all 4,000 in seconds, then list names, technical strength, P.E., growth rate, dividend, earnings, reward-risk, etc., and then chart.	Provides remote job entry, real time and batch processing. Applications are available for the general financial services industry, life, and casualty insurance areas. Customers can either use the standard application or program their own. Provides comprehensive support for McCormack & Dodge's Millennium System.	A supplier of computer, financial, and information services to more than 2,000 clients within the investment community. SEI also offers a series of high-quality institutional investment products; automated investment transaction services for electronic brokerage, clearance, and settlement; access to securities pricing and investment research; and comprehensive performance evaluation and consulting.	Provides timesharing, interactive computing, batch processing. Areas of specialization include construction, municipal application, real estate management, engineering, and custom applications. For municipalities, offerings include double entry, budgetary, and multi-fund accounting systems. Construction firm offerings are complete payroll, accounts payable and receivable, job cost, and general ledger systems.

Vendor Name	**I.P. Sharp Associates Ltd.**	**Shaw Data Services**	**The Shuttle Corp.**	**Charles E. Simon & Company**
Address and Phone	2 First Canadian Place, Suite 1900 Toronto, Ontario M5X 1E3 (800) 387-1588	122 E. 42nd Street, Room 610 New York, NY 10168 (212) 682-8877	2569 52nd Avenue, NE Redmond, WA 98052 (206) 882-3447	1333 H Street, Suite 500 Washington, DC 20005 (202) 287-5300
Subsidiary of	—	—	Digital Systems International	—
Principal business	On-line computer service company; software vendor	On-line computer service company	On-line services company; computer systems manufacturer	On-line service company; database producer; information broker
Applications emphasis	Finance; data communications; engineering and scientific; insurance; sales and distribution; transportation; price indices; environment; bonds; investments; petroleum; econometrics; bibliographic research; aviation; statistical time series; census data; demographics	Banking and finance; money management; investor relations; pension services	Banking and finance; data communications; information resource	Banking and finance; legal; securities
President	Ian P. Sharp, CEO	William O. Burnett	Michael L. Darland	Margaret Grisdela
Director of marketing	—	John J. McGowan	Frank Johnson	Randall N. Green
Date founded	1964	1976	—	1972
No. of employees	600; 90 percent devoted to on-line services	160; 100 percent devoted to on-line services	10; 20 percent devoted to on-line services	45; 5 percent devoted to on-line services
Rev. last FY	$47M+; 100 percent from on-line services	$10M-$19M; 100 percent from computer services	—	—
Primary customers	End users include major banks, insurance companies, manufacturers, airlines	Money managers, investment advisors, pension fund managers	Banks and entrepreneurs	Lawyers, investment brokers, librarians, corporate personnel
Product line	Provides APL timesharing, software, and special systems. Customers have access to an application library and over 50 million time series of public data including information relating to security, banking, energy, and insurance. Also provides turnkey systems, feasibility studies, hardware evaluation, systems design, contract programming and design, and selection of communications facilities.	Provides an on-line portfolio management service for money managers. Client access is via a dedicated communications network. Over 700 on-line displays are available daily (up-to-date as of previous business day). Offers a variety of internal and external reports, and includes an automated interface with the ID System, Foreign Securities capability, and a Trading Support Service.	A national network of locally operated systems in all major metropolitan areas. The company plans to make it possible for users at home to access AP news, NOAA weather, and specialized banking applications such as funds transfer without long-distance charges.	Research firm specializing in the research and retrieval of documents filed with the Securities and Exchange Commission, the banking agencies, and all other federal agencies. The company produces the Corporate Ownership Profiles and Mutual Fund Monitor databases and reference guides to the Poison Pill anti-treatment defense.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Simplex Systems, Corp.	Singapore International Software Services Ltd.	SIPE Optimation S.p.A.	Smart Communications, Inc.
Address and Phone	60 Madison Avenue New York, NY 10010 (212) 889-1337	77 Robinson Road, #14-00, SIA Building Singapore 0106, Republic of Singapore (65) 2230211	Via Silvio D'Amico, 40 00145 Rome, Italy (06) 54761	825 Third Avenue, 30th Floor New York, NY 10022 (212) 486-1894
Subsidiary of	—	Singapore Airlines	BNL Holding	—
Principal business	On-line computer service company; software vendor, selling software for use with IBM 360/370/4331/4341	On-line computer services company; software vendor	On-line service company; database producer; off-line service company; software vendor	On-line computer service company; computer-aided language translation software
Applications emphasis	Accounting; payroll and personnel; sales and distribution; transportation; accounts receivable; accounts payable; general ledger; inventory control; cost accounting; billing/invoicing/collection; demographics; census data	Banking and finance; aviation; energy; economics	Banking and finance; government; insurance; legal	Language translation
President	Elliot S. Gerard	Lim Yeok Chiang, Managing Director	Elio Tartaglia	John M. Smart
Director of marketing	—	Christina Chen, General Manager	Roberto Liscia	Albert J. LaMothe
Date founded	—	1981	1969	1973
No. of employees	25; 85 percent devoted to on-line services	16; 80 percent devoted to on-line services	380	15; 70 percent devoted to on-line services
Rev. last FY	—	—	$10M-$19M; 58 percent from computer services	$500K-$999K; 70 percent from on-line services
Primary customers	Transportation and service organizations	End users	Legal consultants, banks, businesses	Manufacturers of products that require international product support, manuals
Product line	Provides on-line processing for accounts receivable and billing systems for service companies. Other available applications include bus transportation, accounts payable, inventory, general ledger, and cost accounting. The company also provides demographics tape selection and census and commercial tapes.	Offers a computer timesharing service, with public databases covering economics, aviation, finance, energy, and actuarial areas. Applications software is available in a variety of areas including personnel administration and financial analysis. Private databases and custom-tailored programs can be created as desired. The company's timesharing service can be reached from 500 cities worldwide.	Producers of the Nova Fiscal database. The database contains information on taxation and fiscal issues in Italy. The data is used by fiscal consultants, law offices of large banks, and professional associations.	Provides an electronic translation and electronic publishing service for the rapid translation of technical manuals into French, Spanish, Italian, Portuguese, German, Arabic, and other languages. Output may be on disk, tape, typeset, or laser printed. Access to the service is via telecommunications available 7 days a week, 24 hours a day.

Vendor Name	Smart, Inc.	Solution Systems, Inc. (SSI)	Sophisticated Data Research, Inc.	Southeast Data Center
Address and Phone	26 Cricket Lane Wilton, CT 06897 (203) 762-3279	114 Forrest Avenue Narberth, PA 19072 (215) 668-4620	2251 Perimeter Park Drive Atlanta, GA 30341 (404) 451-5100	286 Euclid Avenue, Suite 108A San Diego, CA 92114-3610 (619) 262-6552
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; database producer; off-line computer service company; software vendor	Remote computing services ; on-line computer services company	On-line computer service company; database producer; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. VAX Systems; IBM-PC/XT/AT	On-line computer service company; off-line computer service company
Applications emphasis	Data management and database management; sales analysis; inventory control; retail trade data	Engineering and scientific; data management and database management	Mathematics and statistics; consumer and market research	Accounting; medical and health care; payroll and personnel; medical billing procedures; medical office accounting; patient registration and scheduling
President	James Clarke Spring	Neil Kleeman	David M. Feldman	Dr. Edgar Guinn, General Manager
Director of marketing	—	Ben Marino	William D. Neal	—
Date founded	1969	1981	1973	1975
No. of employees	30; 70 percent devoted to on-line services	—	75; 10 percent devoted to on-line services	4; 75 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 100 percent from on-line services	—	—	$500K-$999K; 100 percent from on-line services
Primary customers	Retail specialty chains, independents	Engineering and scientific community; business community	Marketing research companies and departments	Medical clinics and doctors
Product line	Provides on-line and batch processing through the company's data center. Available in the merchandising area include sales analyses, turn analysis, and inventory management with a merchandising numbering system. The company also provides marketing research for sporting goods manufacturers.	Provides remote computing services for the business and scientific/engineering community. The company offers near-supercomputer processing speeds (up to 60 million operations per second) while maintaining user accessibility through interactive access. SSI's services are available on an interactive or batch basis from terminals, personal computers, or in-house computers.	Provides a full line of data processing services to the professional marketing researcher. These services include: on-line timesharing services, survey coding, special software development, data entry, data entry systems, maintenance of proprietary databases, crosstabulations, multivariate analyses, Panel Management Systems, and seminars in marketing research data analysis.	A service bureau primarily offering on-line or batch medical applications for health clinics and/or individual doctors. The package includes patient registration transactions, various look-up-information-type programs, medical billing, plus a host of related programs. Also provides payroll, accounts payable, and general ledger packages, as well as an entire pharmacy software package.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	SpecialNet	Spectron Corp.	Standard and Poor's Financial Systems & Trading Services Group	State Street Bank and Trust Company, Correspondent Services Division
Address and Phone	2021 K Street, N.W., Suite 315 Washington, DC 20006 (202) 296-1800	1517 South Harvard Tulsa, OK 74112 (918) 743-6431	11 Broadway New York, NY 10004 (212) 412-0100	225 Franklin Street, P.O. Box 351 Boston, MA 02101 (617) 786-6355
Subsidiary of	National Association of State Directors of Sp.Ed. (NASDSE)	—	—	State Street Boston Corp.
Principal business	On-line computer service company	On-line computer service company	On-line computer service company; turnkey software; consultants; financial market data	On-line computer service company; ATM EFT Services
Applications emphasis	Education; electronic mail; data collection/information management	Medical and health care; medical office accounting; accounting; payroll and personnel; general ledger; sales analysis; inventory control; order processing	Accounting; banking and finance; data communications; data management and database management; securities	Banking and finance
President	Gary D. Snodgrass	Mathai C. Joseph	James Ryan	Sidney K.Horton, Division Head
Director of marketing	Linda K. Gibbs	—	Charles M. Peck, Sr. Vice-President of Marketing and Sales	—
Date founded	1981	1969	1970	1964
No. of employees	6; 100 percent devoted to on-line services	7; 100 percent devoted to on-line services	150	120; 80 percent devoted to on-line services
Rev. last FY	$200K-$499K; 100 percent from on-line services	$500K-$999K; 100 percent from on-line services	$20M-$50M	—
Primary customers	Educational Administrators	Manufacturers, oil and gas companies	Securities firms, investment advisors, banks	Banks and thrift institutions, and other financial institutions
Product line	Provides the following services in an on-line environment: electronic mail—personal correspondence between individuals and groups; electronic bulletin boards—up-to-the-minute information on key topics in education; data collection and information management systems—computer-based tools for conducting surveys and storing and analyzing information.	Provides an on-line computer service for general business applications. Applications include general ledger, payroll, accounts payable, accounts receivable, order entry, invoicing, sales analysis, and inventory. Offers customized programs in the general business applications area which the customer runs on the host computer. Terminals are placed in the user's location.	Provides computer services and products in 3 areas designed to meet the management information and data processing requirements of the financial industry. The principal activities are developing computer systems for securities firms, investment advisors and banks; providing real-time, interactive computer services supporting securities trading; and developing standardized applications software.	Provides an on-line banking system including Savings, NOWs, Cash Reserve, personal and corporate Demand Deposit Accounts, Installment Loans, Mortgages, IRA/Keogh, Certificate of Deposits, Management Reporting, Central Information File, and Equity Credit Line. Also offers a comprehensive Electronic Funds Transfer Support System, including the New England Automatic Clearinghouse.

Vendor Name	Statewide Information Systems	Statistical Tabulating Corp.	Stockholm University Computing Center, QZ	Strategic Intelligence Systems
Address and Phone	P.O. Box 421 Tustin, CA 92680-9990 (714) 547-0590	2 North Riverside Plaza Chicago, IL 60606 (312) 454-8000	Linnegatan 89, P.O. Box 27322 S-102 54 Stockholm, Sweden 46 8 679280	575 Madison Avenue New York, NY 10022 (212) 725-4540
Subsidiary of	Statewide Data Services	—	Swedish Government, Department of Education	—
Principal business	On-line computer service company; database producer	On-line computer service company	On-line computer services company; database producer; software vendor	On-line services company; database producer; software vendor
Applications emphasis	Banking and finance; legal; credit information	Accounting; data management and database management; education; government; insurance; manufacturing; medical and health care; sales and distribution	Data communications; data management and database management; education; engineering and scientific; government; mathematics and statistics; medical and health care	Banking and finance; insurance; media; financial services; food industry; pharmaceutical industry information
President	Deena Zachritz	Michael R. Notaro	Bengt Olsen	Ruth Stanat
Director of marketing	John Thomas	—	Toenu Spuhl	Henry Berszinn
Date founded	1964	1936	1968	1984
No. of employees	200; 20 percent devoted to on-line services	400; 33 percent devoted to on-line services	125	20; 70 percent devoted to on-line services
Rev. last FY	$1.0M-$4.9M; 20 percent from computer services	$20M-$50M; 70 percent from on-line services	$5.0M-$9.9M; 100 percent from on-line services	$200K-$499K; 30 percent derived from computer services
Primary customers	Service vendors	Cross-business	Universities, government, and the general public	End users, research librarians
Product line	Provides database access to mortgage credit reporting bureaus, credit bureaus, lending institutions, attorneys, and private investigators. The company has both commercial and consumer databases.	Provides timesharing and batch processing services. The company also offers data entry services and electronic laser beam printing.	As a software vendor, sells computer conferencing systems for Digital Equipment Corp. systems. Its service bureau consists of 16 computers, serving on-line customers in over 30 countries. The Center is connected to Datapak, Euronet, Telenet, Tymnet, and other networks. Codes include word processing, mathematics, statistics, graphics, construction, scientific applications, and database systems.	Produces six intelligence databases for the food, financial, technology, telecommunications, and electronics industries. Each database offers current scanning of competitive activities; research and analysis; custom database and system design; and a system to input competitive intelligence documents.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	STSC, Inc.	SunGard Computer Services	Systech, Inc.	Systematics, Inc.
Address and Phone	2115 East Jefferson Street Rockville, MD 20852 (301) 984-5000	1285 Drummers Lane, Suite 300 Wayne, PA 19087 (215) 341-8700	6150 Joliet Road Countryside, IL 60525 (312) 352-0365	4001 Rodney Parham Road Little Rock, AR 72212 (501) 223-5100
Subsidiary of	Continental Telecom, Inc.	—	—	—
Principal business	On-line computer service company; software vendor	On-line services company; software vendor	On-line computer service company; software vendor, selling software for use with Hewlett-Packard 3000; facilities manager; computer system manufacturer	On-line computer service company; off-line computer service company; software vendor, selling software for use with OS/MVS, DOS/VSE, HP-3000 (Trust); facilities manager; maintenance company; consulting
Applications emphasis	Banking and finance; price indices (consumer/producer/industry); corporate financial information	Banking and finance; data management and database management; mathematics and statistics; sales and distribution; graphics; budget systems; project management	Accounting; manufacturing; payroll and personnel	Accounting; banking and finance
President	William Gibson	David S. Douglas	David Ickow	Ray Maturi
Director of marketing	—	—	Elliott Welsh	Dudley Shollmier
Date founded	1969	1975	1977	1967
No. of employees	370	—	18	2000
Rev. last FY	$20M-$50M; 100 percent from on-line services	$50M or more	$1.0M-$4.9M; 15 percent from on-line services	$50M or more
Primary customers	Corporate financial management	Software development companies, client-based mktg. and banking divisions, and mass mailers	End users	Commercial banks, thrifts
Product line	Provides remote access computing services and licensed software products. The company develops APL programming language software and related products and services. Software is developed and delivered in micro, mini, and mainframe environments. Also develops and markets application software used by logistics professionals. The company's timesharing service provides access to databases.	Provides remote computing services via timesharing, dial-up, or dedicated system access. Software tools include MVS/SP/XA, VM/CMS, TSO/SPF, CICS, DOS, Wylbur, IMS, DB2, Groupl, INFO, HSM, JES2, many language compilers, and other high-efficiency support packages.	Provides timesharing services accessing software packages, customized applications, and electronic mail throughout the world. Markets and installs on-line interactive database management systems. Hardware and custom application software is available in a facilities management relationship.	Provides a wide range of data processing services to the financial industry through data processing centers staffed, equipped and operated by Systematics. In providing these services, Systematics develops and uses its own proprietary applications software designed for use on IBM computers. They also market this software to others operating their own data processing departments.

Vendor Name	Systems Data Processing Corp.	Technical Advisors, Inc.	Technical Data Corp.	Technical Database Services, Inc. (TDS)
Address and Phone	9342 Tech Center Drive #800 Sacramento, CA 95826 (916) 364-7372	4455 Fletcher Street Wayne, MI 48184 (313) 722-5010	330 Congress Street Boston, MA 02210 (617) 482-3341	10 Columbus Circle, Suite 2300 New York, NY 10019 (212) 245-0044
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; facilities manager; turnkey systems	On-line computer service company; off-line computer service company	On-line service company; database producer	On-line computer service company; database producer
Applications emphasis	Accounting; payroll and personnel; management reporting systems; accounts receivable; inventory control; general ledger; sales analysis; membership management systems; construction	Land surveying; engineering and scientific	Investment management; financial services	Engineering and scientific; chemistry related information
President	R. W. Johnson	Edward G. Brender	Andrew G. Mills	Mildred Green
Director of marketing	—	—	Jody Morse	Wendy Stern Fenwick
Date founded	1958	1954	1980	1983
No. of employees	25; 40 percent devoted to on-line services	6; 70 percent devoted to on-line services	60+; 33 percent devoted to on-line services	9
Rev. last FY	—	$500K-$999K; 40 percent from on-line services	$5.0M-$9M	—
Primary customers	Retail/wholesale/manufacturers	Engineering field	Bond trades, money managers	End users, information specialists, research librarians
Product line	Provides turnkey systems, timesharing, and remote batch processing for accounting applications to the Sacramento and Northern California area. Offers accounts receivable, payroll, inventory control, general ledger, sales analysis, and management reporting.	Provides on-line and off-line services through their computer center in Wayne. Offers technical programs used by engineers and land surveyors. The company also provides remote plotting capabilities.	Offers a variety of analytical and advisory services worldwide via major financial information networks that include Knight-Ridder, Telerate Systems, Inc. and Quotron Systems, Inc. The company also offers investment professionals easily accessible, centralized information services on a monthly subscription basis. The company has established operations in London and Geneva.	Develops and markets on-line search and retrieval services. Offers NUMERICA, a database that contains a complete line of hard data including the physical, thermodynamic, transport, and other properties and specifications for chemicals, materials, and mixtures. All information is updated at regular intervals and is programmed for immediate access on the TDS computerized system.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Tel-A-Data, Inc.	TeleData*Guide/InfoText	Telenet Communications Corp.	Telmar Group, Inc.
Address and Phone	1500 Northwest 167th Street Miami, FL 33169 (305) 625-8266	P.O. Box 6728 Alexandria, VA 22306-0728 (703) 339-7097	12490 Sunrise Valley Drive Reston, VA 22096 (703) 689-6000	902 Broadway New York, NY 10010 (212) 460-9000; (800) Telmar-1
Subsidiary of	—	JMARCO, Inc.	US Sprint Communications Company	—
Principal business	On-line computer service company	On-line computer services company; off-line computer services company	Enhanced data communications services and products	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. System-10 and IBM PCs
Applications emphasis	Accounting; payroll and personnel; sales and distribution; inventory control; sales analysis; accounts receivable; accounts payable	Education; engineering and scientific; government; management sciences; manufacturing; media; medical and health care; transportation	Data communications; networking; electronic mail	Media; sales and market information; advertising; accounting
President	George Niver	Martha Guide	Paolo Guidi	Stanley P. Federman, Chairman
Director of marketing	—	Jeffrey Guide	—	Harry Appel, Executive Vice President
Date founded	1966	1980	—	1968
No. of employees	5; 100 percent devoted to on-line services	4; 75 percent devoted to on-line services	—	75; 100 percent devoted to on-line services
Rev. last FY	—	Under $200,000; 100 percent from computer services	—	—
Primary customers	Liquor wholesalers	Consultants, business community, scientists, and engineers	Database providers, businesses, educational institutions, government agencies	Advertising agencies, advertisers, magazine publishers, newspapers, radio, television
Product line	Provides on-line applications via timesharing and off-line processing. Available applications include inventory control, sales analysis, payroll, accounts receivable, and accounts payable. Currently serving the state of Florida.	Provides a computerized information retrieval and document location service. The company also provides electronic news clipping and computerized typesetting services.	Provides access to a nationwide packet switched data network. The network is nationwide; used by service bureaus, educational institutions, and other companies. Overseas access for Telenet customers is available to and from 75 countries. Telenet also supplies private networks for large corporations and government agencies, and hybrid networks which combine public and private networks.	Provides on-line and off-line access to applications and databases in the advertising and media information areas. Applications include marketing, media planning, analysis systems, statistical analysis, post-analysis systems, database management, accounting, and report generation.

Vendor Name	Tesseract Corp.	THERMODATA	3rd Base Software Registry	Three PM/McKesson (3PM)
Address and Phone	150 Spear Street San Francisco, CA 94120-7658 (415) 543-9320	B.P. 66 38402 St. Martin D'Heres Cedex, France 33(1) 76 42 76 90	P.O. Box 6354 Lafayette, IN 47903 (317) 742-5369	30881 Schoolcraft Livonia, MI 48150 (313) 427-2000
Subsidiary of	Prudential	—	STEL Enterprises	Division of McKesson Corp.
Principal business	On-line computer service company; software vendor, selling software for use with IBM 360/370/303X/4300	On-line service company; database producer; off-line service company	On-line services company; database producer; information systems developer; consulting	On-line computer service company; off-line computer service company
Applications emphasis	Payroll and personne!	Data management and database management; engineering and scientific; chemistry related information	Marketing program services; marketing; data processing	Data management and database management; medical and health care; payroll and personnel; sales and distribution; pharmaceutical industry information
President	Charles Yazel	J.E. DuBois	William "Bill" K. Elbring	R. Thomas Cook
Director of marketing	Barbara Levin	B. Cheynet	Judy H. Elbring	Terry Swortwood
Date founded	1972	1974	1969	1970
No. of employees	110	—	5; 80 percent devoted to on-line services	450; 40 percent devoted to on-line services
Rev. last FY	—	Under $200,000	Under $200,000; 50 percent from computer services	$32M; 20 percent from on-line services
Primary customers	Cross-industry	—	Third-party developers and users of specialty software	Pharmacies, automotive companies, health insurance companies; FTD florists
Product line	Provides functions for total human resource management. Functions include compensation application tracking, position control, government compliance, on-line check calculation, complete tax maintenance to local level, flex benefits, and defined contribution programs. All systems standalone or fully integrate into a single nonredundant database. All systems are on-line, real-time, and table-driven.	Provides help and advice concerning the physical chemistry of metals, alloys, inorganic compounds, and gases. The company also produces a database called THERMODATA. The database contains critically evaluated thermodynamic values for more than 3,000 chemical compounds and diluted solutions.	Offers a cost-effective solution to the "advertising" needs of the vertical market developer. Developers enter and maintain their product information. Searchers determine the availability of existing software, particularly vertical market applications. Ordering information as well as product abstracts is available on-line. A referral service is available to advise developers of all qualified inquiries.	Provides an on-line and batch processing pharmacy system offering functions required by pharmacists in filling prescriptions. The functions include the customer's name, insurance number, drug name, and billing. The system also generates daily and monthly reports. Third party claims can be processed. Also offers a medical system which performs functions similar to the pharmacy system.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	TIM-Formation, Inc.	Timesharing Management, Inc.	TLS, Co.	TNO Computer Center
Address and Phone	1913 Central Avenue Albany, NY 12205 (518) 456-6211	806 Massachusetts Avenue Cambridge, MA 02139 (617) 661-9166	2780 Snelling Avenue N. St. Paul, MN 55113 (612) 633-5262	P.O. Box 297 2501 BD The Hague, Netherlands 70 524161
Subsidiary of	—	—	—	Netherlands Organisation for Applied Scientific Research
Principal business	On-line computer service company; consultants	On-line computer service company; database producer; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11/VAX; facilities manager; computer system manufacturer; consultants	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11/03/11/23/11/34A/11/44/11/70	On-line services company; off-line services company
Applications emphasis	Accounting; government; insurance; payroll and personnel; sales and distribution	Accounting; banking and finance; management sciences; financial planning	Payroll and personnel; general ledger; tax calculation/budgeting/processing; accounts receivable; accounts payable; time accounting	Accounting; data communications; data management and database management; engineering and scientific; management sciences; mathematics and statistics; payroll and personnel; sales and distribution
President	Kenneth E. Willcox	James Rouse, Jr.	Von Elbert	A. A. Koene
Director of marketing	Gary E. Ellnor	Donald Vincent		W. Kardux
Date founded	1976	1978	1969	1945
No. of employees	7; 100 percent devoted to on-line services	4	30	40; 100 percent devoted to on-line services
Rev. last FY	$500K-$999K; 100 percent from on-line services	—	—	$1.0M-$4.9M; 100 percent from computer services
Primary customers	Small businesses, state government	Big 8 accounting firms	Accountants, general business	End users, scientists
Product line	Provides on-line processing services to end users in the Albany area. Designs and programs proprietary packages on a customer contract basis.	Provides timesharing services. Offers conversational financial analysis, corporate modeling and reporting, and financial planning and forecasting. An area of specialization is a tax modeling system. The company produces a database containing a summary of the current tax laws as well as providing system integration for customized applications.	Provides timesharing, service bureau, and in-house minicomputer processing. Software includes a general ledger package which is designed to accommodate frequent changes in report format, emphasis, detail, and summarization. The company offers a tax processing system, accounts receivable, accounts payable, time and billing, payroll, and related programs.	Provides a timesharing, software, and advice bureau for technical, scientific, statistical and administrative applications. The company also provides micro-to-mainframe links.

Vendor Name	Touchette Corp.	TRADECENTER	Trade*Plus, Inc.	Transamerican Telecomputing Company
Address and Phone	5701 Enterprise Parkway East Syracuse, NY 13057 (315) 445-0291	25 Hudson Street New York, NY 10013 (212) 225-4700	P.O. Box 60970 Palo Alto, CA 94306 (415) 324-4554	9016 Wilshire Boulevard Beverly Hills, CA 90211 (213) 650-2300; 273-6213
Subsidiary of	—	Knight-Ridder Newspaper, Inc.	—	Starcom Corp.
Principal business	On-line computer service company; off-line computer service company; database producer; software vendor; facilities manager; computer system manufacturer; consultants	On-line computer services company; software vendor	On-line computer services company	On-line computer service company
Applications emphasis	Accounting; data management and database management; engineering and scientific; government; manufacturing; media; payroll and personnel; sales and distribution; transportation	Banking and finance; marketing; commodities; stock information; investment reporting; investor relations	Banking and finance; investment management	Accounting; data communications; data management and database management; education; engineering and scientific; legal; mathematics and statistics; media; medical and health care; payroll and personnel; sales and distribution; transportation
President	John Touchette	Don Roll, Executive Vice President	William A. Porter	David W. Starr
Director of marketing	Tom Touchette	Steven Goldstein	—	—
Date founded	1968	1976	1982	1980
No. of employees	100	60; 90 percent devoted to on-line services	—	35; 60 percent devoted to on-line services
Rev. last FY	—		—	$200K-$499K; 60 percent from on-line services
Primary customers	Cross-industry	Portfolio managers, institutional investors, and money managers	Individual investors; professional investors	—
Product line	Offers computer services via timesharing and batch processing. Available applications include accounts receivable, accounts payable, and financial statements. Custom programs are developed for order entry, billing, and inventory. The company provides microfiche and microfilm and sells Basic Four computers with software.	Provides real-time, historic graphic price information and analysis on stocks, bonds, options, and futures utilizing high resolution graphics; an extensive database; customized software; and customized data feeds.	Provides quotes and trading of every stock and stock option listed in the Wall Street Journal for investors via personal computers. The user can keep up to 75 portfolios that are automatically updated when the user buys or sells a security. The company also allows its subscribers to transfer stock and option prices and other data onto their own worksheets, such as VisiCalc, Multi-Plan, and Lotus 1-2-3.	Provides general interest timesharing services. These services include access to databases; games and programming; mailing list maintenance; an electronic mail system; a community bulletin board; an inter-user interactive communication (CHAT); Voicemail—an telephone answering service; and a users interest directory. On-line access is provided over the Tymnet network.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Tristar Data Systems, Inc.	Tru-Check Computer Systems, Inc.	TSR, Inc.	TUI Computer Services, Inc.
Address and Phone	2 Keystone Avenue Cherry Hill, NJ 08003 (609) 424-4700	6 Nursery Lane Rye, NY 10580 (914) 967-9300	400 Oser Avenue Hauppauge, NY 11788 (516) 231-0333	240 Great Circle Road, Suite 326 Nashville, TN 37228 (615) 242-4477
Subsidiary of	—	—	—	—
Principal business	On-line computer service company	On-line computer service company; off-line computer service company	On-line computer service company; consulting and programming; facilities management; text database and demand pricing; marketing for financial institutions	On-line computer service company
Applications emphasis	Accounting; manufacturing; sales and distribution; inventory control; accounts receivable; billing/invoicing/collection; job cost accounting	Data processing	Accounting; finance; data management and database management; engineering and scientific; government; insurance; management sciences; payroll and personnel; sales and distribution; graphics; market information; administrative systems	Media; sports; real estate management
President	Daniel F. Brown	Roger J. Kaufman	James Raney	Trevor Evans
Director of marketing	—	Dennis C. Slawson	Robert K. Galvin	Vicky Fields
Date founded	1969	1969	1968	1976
No. of employees	25; 95 percent devoted to on-line services	—	130; 5 percent devoted to on-line services	4
Rev. last FY	$1.0M-$4.9M; 95 percent from on-line services	—	$20M-$50M; 10 percent from on-line services	—
Primary customers	Wholesale distributors, manufacturers	Not-for-profit fund raising organizations and subscription publications	Fortune 500 cross-industry	End-users
Product line	Produces on-line services for inventory control, accounts receivable, invoicing, and job costing. Integrated records provide updating to all areas when one entry is made. The company also provides summaries of daily activities, inventory, and sales activities. Also provides receivables status as well as custom programs.	Produces a Fund-Raising service which allows on-line inquiry and updating of donors. Users may request MIS reports, typewriter-quality letters, and labels on donors selected from their donor database according to geographic, demographic, and/or financial criteria. The company also provides a circulation fulfillment system including sophisticated mailing processing and custom management reports.	Provides remote computing services and proprietary databases. Applications include financial management, corporate and strategic planning, engineering and operations, administration, and decision support. The company provides access to databases and supports APL, Basic, Fortran, Cobol, and PL/1 programming languages. It also offers VM/APL. The company provides a Fixed Price Timesharing (FPT) service.	Provides customized software services for BTI computers and on-line timesharing services. Special applications include television news rooms (elections, sports, and statistics); real estate matching listing and analysis, and a labor union package. Clients access information at the computer center in Nashville or from their own in-house BTI computer.

Vendor Name	TWS, Inc.	Tymnet, McDonnell Douglas Network Systems Company	Uni-Coll Corp.	Unilever Computer Services Ltd.
Address and Phone	730 N. Postoak Houston, TX 77024 (713) 682-7845	2710 Orchard Parkway San Jose, CA 95134 (408) 946-4900	3401 Market Street Philadelphia, PA 19104 (215) 387-3890	55/57 Clarendon Road; PO Box 110 Watford, WDI ISA, England 44 (923) 47911
Subsidiary of	—	McDonnell Douglas Corp.	CISInetwork Corp.	Unilever PLC
Principal business	On-line computer service company; off-line computer service company	Public and private data communications network	On-line computer service company; computer and network services; consultants	On-line computer services company; database producer; off-line computer services company; software vendor; facilities manager
Applications emphasis	Accounting; insurance; payroll and personnel; inventory control; accounts receivable; oil and gas accounting procedures; convention registration system	Data communications; networking; packet-switching; electronic mail	Banking and finance; data communications; data management and database management; engineering and scientific; government; management sciences; mathematics and statistics; facility design and management	Banking and finance; data communications; data management and database management; management sciences; mathematics and statistics; medical and health care; payroll and personnel; transportation
President	Steve W. Trapp	Warren Prince	Mr. Thomas J. Unger	L. Rawle, Chairman
Director of marketing	Vince Jordan	—	Mr. G. A. Kitson	Dr. Nigel Walker
Date founded	1970	1972	1972	1969
No. of employees	26; 10 percent devoted to on-line services	1,000; 100 percent devoted to on-line services	130	500
Rev. last FY	$1.0M-$4.9M; 40 percent from on-line services	—	$10M-$19M; 96 percent from on-line services	$20M-$50M
Primary customers	End users	Database service, timesharing, applications software, and corporate communications vendors	—	—
Product line	Offers on-line or batch access to a medium-sized computer for program development or use of proprietary software in the areas of accounting, oil and gas production accounting, payroll, accounts receivable, large scale convention registration, financial information, and health insurance claims processing.	A communications carrier of value-added networking services to computer users. The Tymnet packet network provides local access in over 600 U.S. metropolitan areas and is also accessible from 70 countries. In addition to the public network, Tymnet also provides private networking services for high-volume users and offers OnTyme electronic message service.	Provides interactive, batch, and remote job entry processing services. Available applications include high level programming languages, data management, scientific and engineering processing, numerical methods, mathematical processing and simulation, investment accounting, and graphics. Also offers I/O services and services such as management and systems consulting, and contract technical services.	Producer of the Zoonoses database. Zoonoses deals primarily with communicable diseases of animals. It covers medical, veterinary, and legal aspects, plus control of the diseases.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Universal Data Systems Ltd.	University of Chicago, Computation Center	University of Southern California, Engineering Computer Laboratory	U.S., Inc.
Address and Phone	57-59 Wakefield Street, P.O. Box 3183 Auckland, New Zealand 33-078	1155 E. 60th Street Chicago, IL 60637 (312) 702-7151	Powell Hall 204, University Park Los Angeles, CA 90007 (213) 743-5520	1611 North Kent Street Arlington, VA 22209 (703) 525-5940; (800) 368-3008
Subsidiary of	—	—	—	—
Principal business	On-line computer services company; off-line computer services company; software vendor; facilities manager; custom written systems	On-line computer service company	On-line computer service company	On-line computer services company; database producer
Applications emphasis	Accounting; banking and finance; payroll and personnel; sales and distribution; insurance	Data management and database management; education; engineering and scientific; mathematics and statistics; graphics	Education; engineering and scientific	Data management and database management; library related information; bibliographic research
President	Trevor Eagle		—	Arthur D. Parker
Director of marketing	Derek Graeme		—	Harriet Velazquez, Vice President
Date founded	1977		—	1971
No. of employees	42; 60 percent devoted to on-line services	125	—	Over 200 in Canada and the U.S.
Rev. last FY	$1.0M-$4.9M; 50 percent from computer services		$500K-$999K; 99 percent from on-line services	$10M-$19M
Primary customers	Insurance brokers, service vendors, distributors, and retailers	University faculty and staff, research institutes	The research community in the University and in industry	Libraries of all types and sizes; book suppliers
Product line	Provides on-line timesharing services for Prime computers with UDS developed software or third-party applications where a royalty is remitted to the author. Turnkey installations are normally provided to Bureau users or first time computer user, where a continued facilities management association exists. The company also has a separate software division that develops custom written applications.	Provides timesharing and batch computing services accessing a program library including mathematics, statistics, graphics, database management, and query applications. The company offers access to a variety of databases, including the National Opinion Research Center's High School and Beyond and the General Social Survey databases. User access is available through Tops 20 and Super-Wylbur.	Provides on-line processing and related services. User service programs and compilers are available. Programs are written by the staff, custom software for the Digital Equipment System/20, or acquired from other sources. One program covers image analysis; image coding; image restoration and enhancement; image edge and texture analysis; image symbolic processes; and image detection and management.	Produces the CATSS database. CATSS allows bibliographic and authority record creation and maintenance. The database has an electronic mail facility, subsystems for authority control, book ordering and product printing. CATSS also includes over 25 million MARC records as well as 5 million REMARC records—the retrospective conversion of Library of Congress cataloguing prior to 1971.

Vendor Name	Users, Inc.	Userware International	Vista Computer, Inc.	Volt Information Sciences, Inc.
Address and Phone	1250 Drummers Lane Valley Forge, PA 19482 (215) 687-9400	2235 Meyers Avenue Escondido, CA 92025 (619) 745-6006	85 Executive Blvd. Elmsford, NY 10523 (914) 592-8190	101 Park Avenue New York, NY 10178 (212) 309-0200
Subsidiary of	—	—	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor	On-line computer service company; software vendor, selling software for use with Digital Equipment Corp. PDP-11	On-line computer service company; software vendor; computer system manufacturer	On-line computer service company; computer system manufacturer
Applications emphasis	Accounting; credit union accounting	Accounting; data management and database management; education; manufacturing; payroll and personnel; sales and distribution	Accounting; data management and database management; management sciences; payroll and personnel; accounts receivable; accounts payable; general ledger; publishing industry services	Data communications; data management and database management; media; typesetting
President	John N. Reardon	Dr. Tom McKaskill	—	William Shaw
Director of marketing	Andrew H. Hamilton, Vice President, Sales	Richard Baldwin	Michael K. Howard	Michael E. Grejtak, VP
Date founded	1963	1968	1977	1950
No. of employees	250	220-250; 50 percent devoted to on-line services	20; 50 percent devoted to on-line services	10,000; 25 percent devoted to on-line services
Rev. last FY	$20M-$50M	$1.0M-$4.9M; 40 percent from on-line services	$1.0M-$4.9M	$50M or more; 40 percent from on-line services
Primary customers	Credit unions	Manufacturing companies, schools, general business	End user organizations, publishers, human resource departments, importers/exporters	Telephone companies, newspapers, printers, publishers
Product line	Provides timesharing, batch processing, turnkey in-house, and distributed systems for credit unions. Information includes demographic and financial records of credit union members and credit union data. Operates as a single source supplier for its member credit unions.	Operates an on-line service bureau using Digital Equipment Corp. PDP-11 and VAX computers. Many applications are custom programmed for individual clients using Userware International Proprietary DBMS and Application Development Tool USER-11 as a basis for all systems. Userware International is also a software house.	Offers timesharing services and sells total systems. Systems include accounts receivable, accounts payable, general ledger, document search and retrieval, human resource planning and management, import/export trading systems, and publishing. Also produces Datascan, a general-purpose database management and reporting system, providing data dictionary and complex file structure.	Provides on-line systems for independent publishers of directories. Volt's services include design of computer systems, software, and DBMS's. Also provided are directory assistance systems (both computer and voice); white and yellow pages directories systems; editorial and classified newspaper systems; and design, development, and manufacture of typesetting systems.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Richard M. Walsh Associates, Inc.	Wang Information Services Corp.	Warner Computer Systems, Inc.	Warrington Associates, Inc.
Address and Phone	925 Oak Street Scranton, PA 18508 (717) 346-3856	120 Wall Street New York, NY 10005 (212) 423-2002	259 Cedar Lane Teaneck, NJ 07666 (201) 692-9400	601 2nd Avenue, South Hopkins, MN 55343 (612) 935-3300
Subsidiary of	—	Wang Laboratories	—	—
Principal business	On-line computer service company; off-line computer service company; software vendor, selling software for use with Digital Equipment Corp. microcomputers and minicomputers; facilities manager	On-line service company	On-line computer service company; off-line computer service company	On-line computer service company; software vendor, selling software for use with IBM 360/370 and Burroughs medium-sized family of computer systems
Applications emphasis	Accounting; payroll and personnel; sales and distribution	Financial information	Banking and finance; data management and database management; insurance; graphics; securities; database downloading; stock information; commodities; bonds; marketing; loan processing; report writer; sales analysis; production scheduling	Banking and finance; bonds; investment management
President	Richard M. Walsh	Larry Jones, CEO	Harvey Krieger	Charles R. Gesme
Director of marketing	—	Sharon Kelly	—	James Thorp
Date founded	1964	1986	1971	1968
No. of employees	75; 100 percent devoted to on-line services	150	77; 90 percent devoted to on-line services	150; 95 percent devoted to on-line services
Rev. last FY	$2,000K; 50 percent from on-line services	—	—	$10M-$19M; 80 percent from on-line services
Primary customers	Colleges and universities, small businesses, associations, chambers of commerce	Equity traders, brokers, merger and acquisition specialists	Financial industry, private investors, insurance companies, end users in the Fortune 1000 companies	Commercial banks, savings organizations, and broker dealers
Product line	Provides timesharing, batch processing, and data entry services through their service bureau operations in Scranton and Jacksonville. Areas of specialization include general business, fund-raising systems, political campaign management systems, and association mngmt. systems. The company sells software; installs turnkey systems utilizing Digital Equipment Corp. computers; and data entry systems.	Markets SHARK, a realtime quotation and financial information system with analytical capabilities. Shark offers realtime and historical data on major market indices as well as the individual stocks. Data includes money flow analysis, relative performance, block activity as well as other pertinent technical and trading statistics. Summaries are displayed in both graphic and tabular formats.	Provides computer processing services. The Insurance Systems Division offers interactive and batch processing for an automobile insurance processing system. The Financial Services Division provides on-line access to databases containing information on the stock market, options, and commodities. The financial applications available include portfolio management; merger and acquisition, credit, and security.	Provides on-line access to the Bond On-line Trading (Bolt) database, a system for investment departments of commercial banks. The system confirms, records, and accounts for money markets and bond trading. The company also offers a security safekeeping system; an investment portfolio system; and a wire transfer system. Nationwide access is available.

Vendor Name	Wayne State University, Computing Services Center	The WEFA Group	Western Library Network	Western Michigan University, Computer Center
Address and Phone	5925 Woodward Detroit, MI 48202 (313) 577-1111	150 Monument Road Bala Cynwyd, PA 19004 (215) 667-6000	Washington State Library Olympia, WA 98504 (206) 459-6518	3326 Rood Hall Kalamazoo, MI 49008 (616) 383-0095
Subsidiary of	—	—	—	—
Principal business	On-line computer service company	On-line computer service company; database producer; forecasting and consulting	On-line computer service company; software vendor	On-line computer service company; off-line computer service company
Applications emphasis	Data management and database management; education; engineering and scientific; mathematics and statistics; medical and health care; graphics; market research	Banking and finance; mathematics and statistics; econometric forecasting; demographics; financial and statistical time series; price indices (consumer/producer/industry)	Library information systems	Data communications; data management and database management; education; engineering and scientific; government; mathematics and statistics; utility management
President	Dr. M. A. Rahimi	Bruce R. Lippke	Nancy Zussy	—
Director of marketing	Patrick J. Grossman	—	David Andresen	—
Date founded	1947	1969	1972	1962
No. of employees	105	160	55; 100 percent devoted to on-line services	25; 80 percent devoted to on-line services
Rev. last FY	$5M-$9M from on-line services	—	$5M-$9M	—
Primary customers	Market research consulting firms; healthcare, government, and educational institutions	Fortune 1000 companies	Librarians	Faculty, students
Product line	Primarily the company provides research and development support for marketing, economics, engineering, software development, data analysis, and the sciences. All of these services are available on-line nationwide via Telenet, Autonet, Tymnet, Datapac, and direct leased line by arrangement. Support services include telephone and on-line consulting, on-line documentation, and training.	Provides timesharing for on-line applications as well as data downloading and alternative data delivery services. Produces a software package-AREMOS-with the capabilities of downloading; mainframe and micro data and equation bank management; report writing and graphing; regression analysis; and model building and solving. The company's databases contain macroeconomics info.	Provides an on-line bibliographic network linking libraries for the purpose of cataloging, acquisitions, reference, and interlibrary loans. The shared cataloging function is based on a database of over 3 million unique titles composed of the Library of Congress MARC tapes and local cataloging of the 140 member libraries. The network includes on-line authority control of name, subject, and series headings.	Provides interactive timesharing. Applications include statistics, mathematics, utility, and data manipulation. Ltd. access is available for educational, government and non-profit institutions. The university is a member of the MERIT computer network.

All About Remote Computing Services

COMPANY PROFILES

Vendor Name	Western New York Computing Systems	Western Union Telegraph Company	Westinghouse Electric Corp., Industry Automation Division	Windsor Systems Development, Inc.
Address and Phone	2131 Five Mile Line Road, P.O. Box 56 Penfield, NY 14526 (716) 381-4120	One Lake Street Upper Saddle River, NJ 07458 (201) 825-5000	200 Beta Drive Pittsburgh, PA 15230 (412) 782-1730	545 Fifth Avenue New York, NY 10017 (212) 697-5390
Subsidiary of	—	Western Union Corp.	Westinghouse Electric Corp.	—
Principal business	On-line computer service company; software vendor; consultants	On-line services company; database provider; telecommunications company	On-line computer service company; software vendor, selling software for use with IBM 360/370/4300.	On-line computer service company
Applications emphasis	Data communications; engineering and scientific; mathematics and statistics; medical and health care; medical billing procedures; membership management systems; credit union accounting	Accounting; banking and finance; engineering and scientific; government; insurance; management sciences; media; manufacturing; medical and health care; sales and distribution; transportation	Manufacturing	Media; graphics; marketing program services
President	Ray H. Hutch	Robert S. Leventhal	—	Eric Murphy
Director of marketing		—	H. Block	—
Date founded	1971	1851		1972
No. of employees	34; 75 percent devoted to on-line services	6,200	500; 5 percent devoted to on-line services	—
Rev. last FY	$5.0M-$9.9M; 10 percent from on-line services	$889M	$1.0M-$4.9M; 100 percent from on-line services	—
Primary customers	End user corporations, credit unions	Business users	Manufacturers	Newspapers
Product line	Provides customized programming and associated on-line timesharing services. Specialized areas include: methods time-measurement, medical billing, membership organizations, and credit unions. The company offers sales, rental leases, and on-site service for computer terminal products.	Provides a wide range of business and consumer services including Telex, Money Transfer, Mailgram, Telegram, Priority Mail, and EasyLink electronic mail service. As part of EasyLink, the company offers access to InfoMaster, an on-line service that acts as a gateway to more than 700 databases.	Offers numerical control tape generation services via remote timesharing services. The company also provides Automatic Program Tool (APT) language processor and postprocessors as well as data processing services for the machine-tool industry.	Provides on-line access to proprietary and syndicated media and marketing data. This on-line service is used for cross tabulations, media schedule analysis, color graphics, and statistical analysis.

Vendor Name	Xerox Computer Services	Ziff Davis Technical Information Company		
Address and Phone	5310 Beethoven Street Los Angeles, CA 90066 (213) 306-4000	80 Blanchard Road Burlington, MA 01803 (617) 273-5500		
Subsidiary of	Xerox Corp.	Ziff Communications Company		
Principal business	On-line computer service company; software vendor, selling software for use with IBM 360/370/303X/4300; Digital Equipment Corp. VAX; consultants; turnkey vendor (manufacturing systems); satellite data communications network	On-line services company; database producer; software vendor; computer system manufacturer		
Applications emphasis	Accounting; government; manufacturing; payroll and personnel; sales and distribution; utility management	Engineering and scientific; government; electronics		
President	William Fello	Philip Korsant		
Director of marketing	Robert Boylan, Sr. VP Marketing	David Miller		
Date founded	1970	1980		
No. of employees	900	200; 40 percent devoted to on-line services		
Rev. last FY	—	$20M-$49M; 50 percent from computer services		
Primary customers	End users	Electrical engineers, components engineers, and purchasing agents		
Product line	Markets a series of compatible products and services for manufacturers, distributors, and public agencies. These include software products, timesharing services, minicomputer hardware, computer terminals, microprocessors, turnkey systems, network services, distributed data processing systems, and professional services. Software is available for certain IBM and Digital Equipment Corp. minicomputers.	Producers of the DesignLine database. The database contains specifications about integrated circuits and discrete devices.		

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Allied Data

Established in 1967, Allied Data was formed by independent telephone company executives to provide data processing services to telephone companies. Today, Allied Data has expanded its services to include the medical sector, local governments, forest product firms, and small, local businesses.

Allied Data offers small business accounting and financial software, as well as numerous medical- and government-oriented services on its own computers, Digital Equipment Corporation (DEC) minicomputers, and IBM-compatible personal computers. Allied Data has clients throughout Washington, Oregon, Wyoming, Idaho, Montana, and Alaska. In keeping with its expansion into a multiindustry service company, Allied Data offers computer batch operations, interactive on-line operations, systems design, data entry, hardware sales, turnkey/minicomputer systems, computer output, microfiche services, and consulting services.

COMPANY INFORMATION

Allied Data
1720 Sleater-Kinney Road
P.O. Box 2406
Olympia, WA 98507
Telephone (206) 456-3535

Company Background

Allied Data was founded in 1967 by independent telephone company executives to meet the data processing needs of independent telephone companies. Today, the company, headquartered in Olympia, WA, offers applications in accounting, word processing, financial analysis and reporting, and telecommunications.

Allied Data's computer center is located at the company's headquarters in Olympia, WA. In addition to supplying batch and on-line interactive services on its own computers, the company also supplies turnkey systems on Digital Equipment Corporation (DEC) minicomputers and IBM-compatible Personal Computers.

With hundreds of clients throughout the Pacific Northwest and Alaska, Allied Data has become a multiindustry service firm, supplying computing services to the telephone industry and to other selected industries, such as medical clinics, doctors' offices, local governments, forest product firms, and local small businesses.

In addition to telephone revenue accounting services, Allied Data provides payroll, computer output on microfiche, general ledger, accounts receivable, job costs accounting, log inventory, medical billing, credit and collections, and numerous government-oriented services for city and county agencies. These services are available on the DEC minicomputers; many of these services are also available on an interactive, on-line basis using Allied Data computers in Olympia and Aberdeen.

Competitive Position

Allied Data's primary market is in the telecommunications software industry with the Telecom Software System. The system is designed to meet the data processing needs of the independent telephone industry. During the past year, Allied Data has enhanced its Telecom Software System by adding a Carrier Billing System. The system provides for complete preparation of bills to all carriers.

Allied Data further enhanced its services by supplying turnkey systems on IBM—compatible personal computers, as well as the company's Digital Equipment Corporation (DEC) minicomputers.

Allied Data currently has 98 employees, and at this date, the 1984 revenues have not been released. According to an Allied Data spokeswoman, the 1984 revenues have increased over the previous year's. Last year's revenues were reported at less than $5 million.

RESOURCES AND FACILITIES

Processing Centers

Allied Data's headquarters in Olympia, WA, houses the company's computers for batch and on-line interactive processing. The branch office in Aberdeen, WA, supplements the Olympia center's processing and provides specific services to the Grays Harbor area.

Customer Support Services

Allied Data maintains a customer support staff of 12 at its Olympia and Aberdeen offices.

Sales and Marketing Services

Allied Data maintains a sales and marketing staff of eight at its Olympia and Aberdeen offices.

APPLICATION-SPECIFIC SERVICES

Accounting

IMS AP—an on-line, interactive Accounts Payable system is available in several versions with different functions and features.

Allied Data

Available system features include:

- Menu control
- CRT screen formatting
- On-line inquiry and input
- On-line or deferred overnight reporting
- Variety of report sort options
- Check reconciliation assistance
- Dollar or percentage discounts
- Automatic file maintenance and expansion
- Multiterminal access

Available reporting features include:

- Vendor master list
- Open voucher report
- Paid voucher report
- Batch proof listing
- Check register
- Cash requirement report
- Outstanding check register
- Expense distribution report
- Duplicate purchase order report
- Duplicate invoice number report
- Checks with stubs

IMS ARS—a comprehensive, interactive Accounts Receivable system capable of accounting for a high volume of accounts. Several versions are available, with different features and functions.

Available system features include:

- Menu control
- On-line inquiry and input
- On-line or deferred overnight reporting
- Variety of report sort options
- Optional finance charges
- "Bill to" and "ship to" addresses
- Master customer numbers for multiple ship to locations
- CRT screen formatting
- Automatic file maintenance and expansion
- Multiterminal access

Available reporting features include:

- Customer master list
- Invoice register
- Posting journals
- Detailed aged trial balance
- Summary aged trial balance
- Sales distribution report
- Delinquent register
- Customer statements

IMS GLS—a flexible, interactive general ledger system providing financial reports for organizations requiring comprehensive financial controls. GLS is available in several versions, each with different features and facilities.

Available system features include:

- Menu control
- On-line inquiry and input
- On-line or deferred overnight reporting
- CRT screen formatting
- Automatic end-of-year closings
- Interfaces with other IMS systems (AP and ARS)
- Comparative variance reporting
- Annual budgets
- Departmental reporting
- Automatic rounding capability

Available reporting features include:

- Balance sheet
- Income statement
- Cash flow statement
- Journals
- General ledger
- Trial balance
- Working trial balance
- Standard journal entries
- Chart of accounts
- Departmental statements

Financial

FINAR (Financial Analysis and Reporting)—an electronic spreadsheet. At its simplest level, it is an intelligent report writer. The user defines the report data items in the form of rows and columns, and FINAR will ask for the numbers to be printed. FINAR automatically calculates column widths, centers titles, and paginates. FINAR also performs calculations on report data and plots reports in graph form.

Word Processing

*CT*OS*—a comprehensive user-friendly word processing software package. Some of the features include:

- Search and replace
- Regular, decimal, and right aligned tabs
- Flexible line spacing within the document or during print mode
- Simultaneous print and edit
- Regular, justified, and semijustified margins
- Prestored margin settings
- Selectable pitch and typeface
- Automatic headers, footers, and page numbering
- Superscripting and subscripting
- Manual or automatic pagination
- List processing
- File merging
- Menu driven

INDUSTRY-SPECIFIC SERVICES

Telecommunications Industry

Allied Data has developed the Telecom Software System to meet the data processing needs of the independent telephone industry. The Telecom software operates on interac-

Allied Data

tive small business computers and is divided into the systems described below.

Customer Service Inquiry—maintains a customer service database containing customer information and equipment locations. Data may be accessed through telephone numbers, service names, service addresses, line assignment number, or cable pair.

Accounts Receivable Status—provides information concerning subscriber's accounts receivable balances. Data is displayed on the terminal to provide assistance in answering customers' questions concerning their accounts.

Accounts Payable—provides cash flow control and shows current cash position and future cash requirements. Data can be automatically posted to a general ledger system and to a work order system.

Payroll—provides an automated payroll and reporting system that produces payroll checks and related reports, and automatically calculates all federal, state, and FICA taxes. The payroll system generates input to the general ledger, work order, vehicle ledger, and continuing property records systems.

Vehicle Ledger—provides an automated vehicle and information report, tracing all operating expenses for company vehicles.

Work Order—generates reports used to monitor costs against a work order, providing both open and closed work order analyses. Data is used as input to the continuing property records system.

General Ledger—provides a complete accounting system that captures entries, maintains a yearly ledger, and provides financial statements along with complete audit trails. Input may be automatically provided from the accounts payable and payroll systems.

Service Order System—provides automated service order monitoring, showing information on service initiation, service charges, or service disconnections for new or prospective customers.

Trouble Ticket Reporting—provides an automated method of monitoring line or equipment troubles from initial reporting through final clearing.

Carrier Billing System—provides for complete preparation of bills to all carriers.

NETWORKING SERVICES

Though Allied Data supports some local interactive processing, most of its systems are designed to be run on interactive small business computers, particularly the DEC line and the IBM-compatible personal computers.

ON-LINE DATABASES

Allied Data supports no public on-line databases, although its clients' individual databases are on-line and available for processing.

OTHER PROFESSIONAL SERVICES

Allied Data offers DEC and IBM PC computers in its computer hardware sales efforts, supplying both hardware and software services to its clients.

FUTURE PLANS

Allied Data plans to continue its expansion as a multiindustry service company in the Northwest, offering services to the telephone industry, medical clinics, doctors' offices, local governments, forest product firms, and local small businesses.

In keeping with its expanding product and service offerings, Allied Data plans to introduce more systems featuring the IBM line of personal computers. □

A.O. Smith Data Systems

A. O. Smith Data Systems, a division of A. O. Smith Corporation, is a leading supplier of Electronic Funds Transfer (EFT) systems and services to the banking and retail industries. A. O. Smith Data Systems provides remote computing services for a variety of applications, including finance, industry, retail, and engineering. For engineering applications, A. O. Smith provides finite element analysis software for electrical and magnetic products.

COMPANY INFORMATION

A. O. Smith Data Systems Division
8901 N. Kildeer Court
Brown Deer, WI 53209
Telephone (414) 357-2700, 1-800-558-6980

Company Background

Organized in 1961, A. O. Smith Data Systems provides a series of on-line remote computing services for finance, industry, retail, and engineering applications. The company supplies electronic funds transfer (EFT) systems and services to the banking, retail, and petroleum industries for automated teller machine (ATM) and point-of-sale (POS) applications. The Engineering Systems group provides finite element analysis software for electrical and magnetic products for a variety of multifacetted industries such as the automotive, computer, and aerospace industries.

A. O. Smith Data Systems is a division of A. O. Smith Corporation, the Milwaukee-based manufacturer of products and services, including feed storage and processing systems; electric, gas, oil, and solar water heating systems; custom glass coatings; fiberglass-reinforced plastic pipe; agricultural financial services; fractional and hermetic motors; and structural components for the automotive industry.

Competitive Position

A leading supplier to the electronic funds transfer (EFT) industry, A. O. Smith Data Systems provides EFT products and services to such customers as Citishare Inc. and Philadelphia National Bank. The company's software and support services provide EFT customers with the expectation of 99.9 percent uptime, according to A. O. Smith Data Systems. This is the highest availability known in the EFT industry.

The rapid growth of the EFT industry may explain why the company is the fastest growing division within the A. O. Smith Corporation. Both sales and earnings reached record levels in 1983. In addition, during 1984, the company's development and customer services staff more than doubled. A. O. Smith Data Systems has restructured its engineering and network services, and is allocating more of its resources to providing products and services to the EFT industry.

RESOURCES AND FACILITIES

Processing Center

The A. O. Smith Data Systems Division's computing center is located in Milwaukee, Wisconsin. At this facility, Data Systems provides processing services for the company's customers across the nation. The Data Center is maintained in a highly secured environment, and features both Tandem NonStop II and NonStop TXP mainframe computers. These facilities provide processing services that can dramatically reduce the time and cost required to implement a local or interregional EFT network.

Systems Software

GUARDIAN is Tandem's transaction-oriented operating system. It resides in each processor and can respond positively to a failure anywhere in the Tandem system. Once GUARDIAN detects an error, it logs the failure, and prevents access to the faulty module without disrupting system operation.

Tandem programming languages supported by A. O. Smith Data Systems include TAL (Tandem Applications Language) and Cobol.

Customer Support Services

A. O. Smith Data Systems employs experienced computer professionals, trained to be sensitive to marketplace trends that may affect its customers. In the Engineering Services Division, the entire engineering staff is involved in, and dedicated to, customer service.

APPLICATION-SPECIFIC SERVICES

Electronic Funds Transfer (EFT) Services

A. O. Smith Data Systems provides EFT switching services to support both regional and national automated teller machine (ATM) and point-of-sale (POS) applications. The company's EFT service supports terminals of all major ATM manufacturers. Service operations feature Tandem NonStop II or NonStop TXP processing and complete network management. In addition, flexible settlement services are provided. Institutions are free to support their own terminals directly or use A. O. Smith's support service. The company provides three major product offerings: Software for EFT, EFT Network Support Services, and Switching Services for EFT.

The *Software for EFT* provides an institution with the technology necessary to implement its own EFT system, ▷

▷ using this software in an in-house computer system to drive ATMs and process transactions. This software is available in a package or as the following individual components:

- The Primary Application System
- Terminal Support System
- Processor Support System
- Card Authorization System
- Settlement System

The EFT Network Support Services provides the primary support vehicle for basic deployment and management of an on-line terminal network. The same system that A. O. Smith markets is used by the company's processing center to supply 24-hour-per-day services to its processing customers. This processing program offers: 24-hour-per-day on-line operation of ATM/POS devices; links to multiple processors; card authorization support; complete settlement services and detailed reports; switching of shared transactions for network participants; and on-going training programs for the customer's staff.

The Switching Services for EFT provides a full shared EFT switch package. Exclusive features of the full switch package include:

- Interface to various hosts
- Complete settlement package
- Complete documentation
- Switching among all sharing parties
- Establishment of cardholder authorization files

Engineering Services

The AOS/MAGNETIC Analysis Program uses the finite element method to calculate magnetic fields and performance parameters for electromagnetic products, such as actuators, generators, motors, and computer recording devices. The software program includes an extensive graphics function that is used to create the finite element model and view the results of the analysis. A display of the calculated magnetic field distribution allows the engineer to see areas of high and low flux density. With a geometric model of a device in hand, the engineer can vary input specifications (such as material properties and applied currents), and see the effects of these variations on the resulting field distribution.

AOS/MAGNETIC also calculates performance parameters, such as forces and inductances. These calculations allow the engineer to upgrade the geometry of the design, change the material requirements, and modify the energy losses, thereby achieving maximum design performance and minimum material usage.

NETWORK SERVICES

For the company's EFT products/services, A. O. Smith uses the EFT Network Support Service for the basic deployment and management of an ATM/POS terminal network. This service is available 24 hours per day. A. O. Smith's engineering services are accessible through long-distance direct dialing or through the GTE Telenet public packet switched network.

FUTURE PLANS

A. O. Smith Data Systems will continue to provide new and innovative EFT products and services to the finance, retail, and petroleum industries. A. O. Smith Data Systems' state-of-the-art technology will continue to respond to the ever-changing needs of the company's customers in the EFT environment. ☐

ADP Autonet

ADP Autonet offers a data communications network that is accessible from 350 domestic locations, as well as 55 foreign countries. A division of Automatic Data Processing, Inc. (ADP), ADP Autonet provides public dial-in, private dial-in, and access ports for multiple terminal connections. The company also provides a computer-based message system called AutoMail, that subscribers can use to send and receive messages via electronic mailboxes and electronic bulletin boards.

The division continues to grow. Its subscriber base has increased about 25 percent over the past 18 months. The division continues to offer asynchronous and X.25 Host Interface options and has added an X.75 network interface option. This option permits transmission of data between different data communications networks.

COMPANY INFORMATION

ADP Autonet
175 Jackson Plaza
Ann Arbor, MI 48106
Telephone (313) 769-6800

Company Background

ADP Autonet, a division of ADP, offers a packet-switching data communications network. ADP Autonet provides the interconnection between remote terminals, personal computers, and host computers.

Autonet links 150 cities in the United States and provides direct toll-free access from more than 350 domestic locations. Interconnections with other public networks further extend local access, and direct connections with International Record Carriers provide service in more than 55 countries throughout the world. Autonet currently supports more than 10,000 domestic access ports. These ports are linked by 250 intelligent communication nodes to more than 400 host computers.

Competitive Position

ADP Autonet's major competitors are CompuServe, Inc.; Telenet; and Tymnet. The company supports approximately 10,000 ports, primarily for other ADP divisions, and a selected, compatible, external client base. The success of the network has been its history of reliability. Autonet continues to publicize a 99.7 percent network availability per month.

Although ADP Autonet faces stiff competition, the company has continued to expand during 1986 and 1987. Autonet's network now extends to 55 foreign countries.

The primary reason for the company's success may be that Autonet is among the most reliable packet-switching networks in service. In addition to its high-availability index, Autonet provides value-added features such as local dial-up access by terminal users, and error correction.

COMMUNICATIONS NETWORK

The Autonet Network consists of intelligent communication computers, called nodes, which are interconnected by wideband communications lines. The network nodes perform two basic functions. First, the nodes act as an interface between the network and the user's terminal or host computer. Autonet supports all commonly used asynchronous hard copy and CRT terminals operating at rates of 110 through 2400 bits per second (bps), and both asynchronous and X.25 Host Interfaces. The second function is to control the network traffic of data transmitted through the network. In addition, ADP Autonet offers an X.75 network interface option, which permits transmission of data between different data networks. ADP Autonet currently interfaces with such networks as Telenet, Tymnet, RCA Globcom, ITT TeleCom, and Telecom Canada Datapac.

The network operates by assembling the characters sent from a terminal or host computer into groups called packets. A destination address, special control information, and error-detection code are also included in the packet.

The network assembles and transmits the packets from node to node to the destination. During the transmission, the packets are examined by each node to determine accuracy. The packets are automatically retransmitted if transmission errors are detected.

At the final node, the packets are placed in the proper sequence and delivered to the destination. Typical end-to-end delivery time is a fraction of a second.

Should a link in the transmission route fail, the packets are automatically rerouted over an alternate path, if one exists, and the user's session continues uninterrupted. In the case of a main circuit interruption along a route that does not offer an alternate path, the user's session and data are generally maintained intact with a momentary delay in response. Autonet initiates dial backup procedures to create a temporary circuit that replaces circuit outage.

PRINCIPAL SERVICES

Autonet supports four network access arrangements—Public Dial-In, Private Dial-In, Dedicated Terminal Facilities (DTFs), and Asynchronous Terminal Concentrators (ATCs). These arrangements enable users to connect re-

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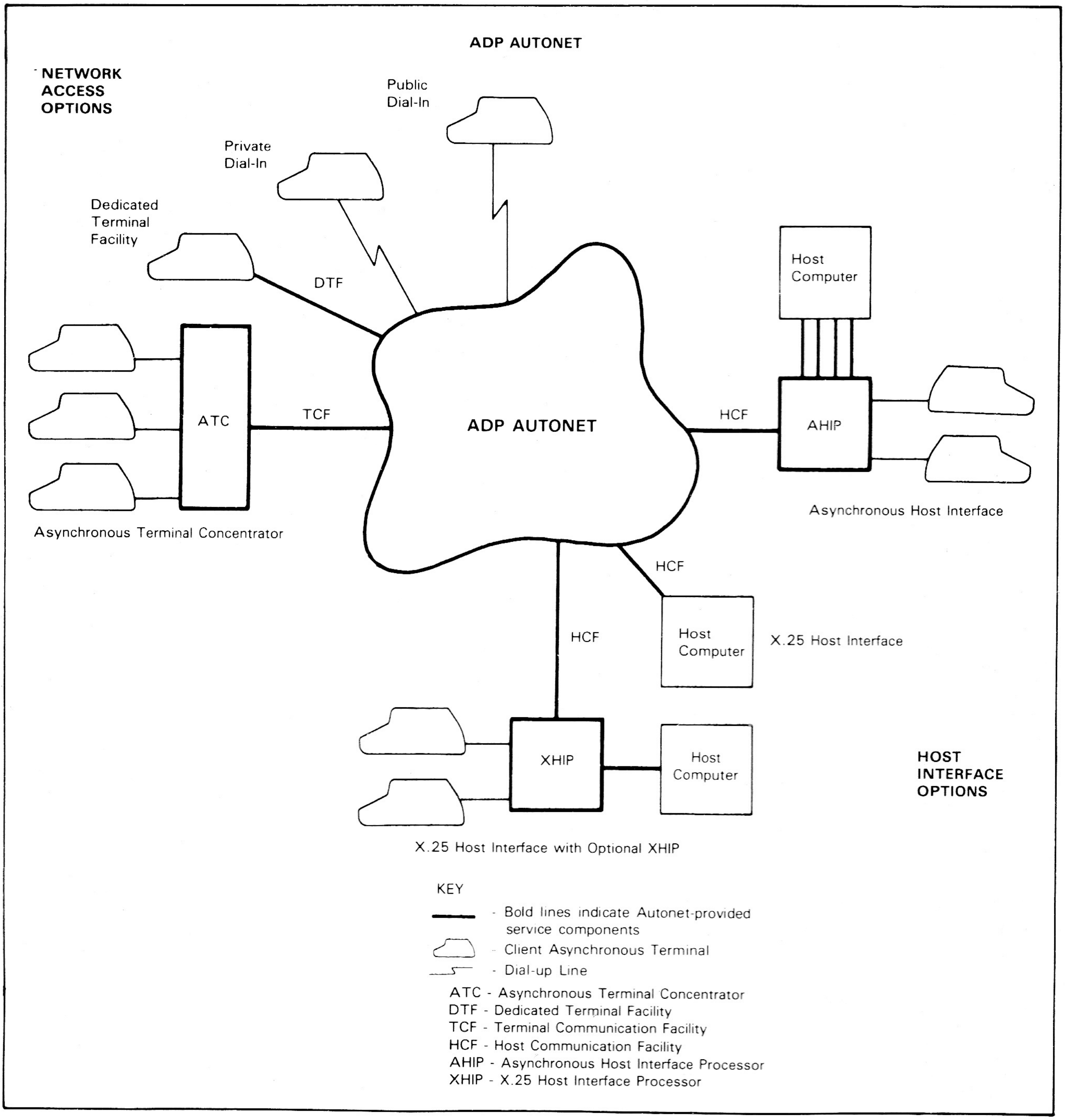
ADP AUTONET
NETWORK ACCESS OPTIONS
Public Dial-In
Private Dial-In
Dedicated Terminal Facility
DTF
ATC
TCF
ADP AUTONET
Asynchronous Terminal Concentrator
Host Computer
HCF
AHIP
Asynchronous Host Interface
HCF
HCF
Host Computer
X.25 Host Interface
XHIP
Host Computer
HOST INTERFACE OPTIONS
X.25 Host Interface with Optional XHIP
KEY
- Bold lines indicate Autonet-provided service components
- Client Asynchronous Terminal
- Dial-up Line
ATC - Asynchronous Terminal Concentrator
DTF - Dedicated Terminal Facility
TCF - Terminal Communication Facility
HCF - Host Communication Facility
AHIP - Asynchronous Host Interface Processor
XHIP - X.25 Host Interface Processor

Figure 1. A composite diagram of the ADP Autonet data communications services.

mote-site terminals to Autonet. Asynchronous and X.25 Host Interface options are also available for connecting computers to the communications network. Figure 1 (Page OL20-066-302) shows how these services connect to Autonet. Both the network access and host interface methods are described below.

NETWORK ACCESS

Public Dial-In—Public Dial-In service enables authorized users to access a public port at the nearest Autonet Communication Center by placing a toll-free telephone call. Local Dial-In ports are available over a widespread geographical area; third-party network access extends the local service coverage further. Where local dial-in is unavailable, toll-free access is provided through an In-WATS service. Autonet is available in the United States and Canada, and interconnections with International Record Carriers provide access from more than 55 foreign countries. It offers port speeds of 110, 300, 1200, and 2400 bps. Charges are based on the resources used; reduced rates for off-peak hours are available by subscription.

Private Dial-In—Unlimited network access from a dial-up port at an Autonet communication center is provided

ADP Autonet

NETWORK ACCESS FROM CLIENT TERMINALS

1. Public Dial-In—Measured Service

	PORT SPEED	HOURLY RATE ($)	NONPRIME OPTION Monthly Subscription ($)	NONPRIME OPTION Hourly Rate ($)
Local Dial-In	110-300 bps	3.00	500	1.50
	1200, 2400 bps	4.00	500	1.50
In-WATS Surcharge	110-2400 bps	19.00		
Third-Party Network Surcharge	110-2400 bps	6.50		

2. Private Dial-In Dedicated Terminal Facility (DTF)—Flat Rate Services*

	PORT SPEED	INSTALLATION ($)	MONTHLY RATE ($)
Private Dial-In	110-300 bps	500	250/port
	1200, 2400 bps	500	275/port
DTF	110-2400 bps	1,000/port	600/port

3. Asynchronous Terminal Concentrator (ATC)—Flat Rate Service**

MODEL	DESCRIPTION	INSTALLATION ($)	MONTHLY RATE ($)
ATC-8	4-8 ports	1,000	600 + 100/4 ports
ATC-32	8-32 ports	1,000	1,300 + 200/8 ports
ATC-80	Up to 80 ports	1,000	1,700 + 200/8 ports
TCF-24	2400 bps	1,400	750
TCF-48	4800 bps	1,400	900
TCF-96	9600 bps	1,400	1,400
TCF-144	14,400 bps	1,400	2,200

NETWORK TRAFFIC

Charges apply to all data transmitted through Autonet.

1. Measured Traffic—$ 0.03/1,000 characters
2. Prepaid Traffic, between predesigned Autonet ports—Flat Rate Service

PORT SPEED	MONTHLY RATE ($)
110-300 bps	100
1200 bps	180

**Private Dial-In includes a private access port at an Autonet Communications Center and unlimited connect time. A DTF includes a dedicated line, modems, and unlimited connect time.*

***Each ATC requires a Terminal Communication Facility (TCF) which includes a dedicated line, modems, and unlimited connect time. When a TCF is installed concurrently with an ATC, the TCF installation charge is reduced to $200.*

Table 1. Autonet's Network Access and Network Traffic price schedule effective July 1, 1987.

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through the network's Private Dial-In service. The dial-up port is continuously available to the subscribers' authorized users. Private Dial-In is available throughout the continental United States. The port speeds available with the service are 110, 300, 1200, and 2400 bps. The access charges are based on a flat monthly rate.

DTF—A DTF is a direct-connect access arrangement between a terminal on the client's site and the nearest communication center. A DTF consists of an access port, a leased channel, and the associated modems. It has available port speeds of 110, 300, 1200, 2400, and 4800 bps. The

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NETWORK INTERFACE TO HOST COMPUTER

1. **Host Communications Facility (HCF) from Autonet to the Host Interface Processor or Host Computer. An HCF includes dedicated lines and modems.**

MODEL	LINE SPEED	INSTALLATION FEE ($)	MONTHLY RATE ($)
HCF-24	2400 bps	1,200	750
HCF-48	4800 bps	1,200	900
HCF-96	9600 bps	1,200	1,400
HCF-144	14,400 bps	1,200	2,200
Interim HCF Service	2,400 bps	NC	250

2. **Asynchronous (AHIP) and X.25 (XHIP Host Interface Processors)**

MODEL	DESCRIPTION	INSTALLATION FEE ($)	MONTHLY RATE ($)
AHIP-32	Up to 32 interface ports	1,000	1,000 + 200/8 ports
AHIP-80	Up to 80 interface ports	1,000	1,400 + 200/8 ports
XHIP-48	Up to 48 local asynchronous ports	1,000	1,400 + 200/8 ports

OPTIONAL SERVICES

SERVICE	RATES ($)	NOTES ($)
1. Virtual Dedicated Ports	425/port/month	Includes unlimited connect time and traffic; minimum of 10 ports; overage charged at $10/hour
2. Dial Back-up	325/line/month	Available for Communication Facilities (TCF and HCF); includes Long Distance charges
3. Private Rotary	100/month + 500 installation	Single phone number access to multiple Private Dial-In ports

ADMINISTRATIVE CHARGES

SERVICE	RATES ($)	NOTES
1. Monthly Account Charge	100/invoice/month	Includes Summary Usage Report
2. Optional Detailed Usage Report	250/report/month	Provided on magnetic tape
3. Validation of New Users	10/user + 3/ month/ID	

Table 2. The pricing schedule for the Host Interface Services, optional services, and other administrative charges.

▷ access fee is a fixed monthly rate. DTFs are offered throughout the continental United States.

ATC—An ATC is an Autonet communications processor that provides access ports for multiple terminal connections. ATCs are located on the client's site and are connected directly to the nearest Autonet communication center by a Terminal Communication Facility (TCF). A TCF consists of an access port, a leased channel, and the associated modems. An ATC will also support dial-up connections from remote locations. ATCs are available to support 4 to 80 terminals. TCFs are available to support data transmission rates of 2400 to 14,400 bps. The ATC access charges are based on a fixed monthly rate. Pricing for installation of TCFs has increased by $200 in the past 18 months to $1,400.

Pricing for the network access methods and network traffic charges are shown in Table 1 (Page OL20-066-303).

HOST INTERFACE

Asynchronous Host Interface—Asynchronous Host Interface is a method of connecting a host computer to Autonet.

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BASIC MESSAGE TRANSMISSION CHARGES	
Create and send to first address (per message segment) *(A)*	$ 0.75
Send to additional addresses (per address)	.30
SPECIAL HANDLING SURCHARGES	
Priority Transmission (per address)	$ 0.15
Special Security Transmission (per address)	0.15
Verified Transmission (per address)	0.15
MESSAGE REPLICATION CHARGES	
Read incoming unread messages	No Charge
Read, file, process other messages (per message segment)	$ 0.10
INQUIRY CHARGES	
Scan Directory (per identifier listed)	$ 0.02
Summarize filed or posted messages (per message selected)	0.02
Index mailbox contents (per item listed)	0.02
UTILITY CHARGES	
System Administration (per activity)	$ 1.00
Message Collation (per use)	1.00
Maintenance of Collations, Distributions, etc. (per activity)	1.00
DISK STORAGE CHARGES	
Storage of Items in Mailboxes (per message segment per day)	$ 0.002
SPECIAL ACCESS SURCHARGES	
Local Dial-in Access via ADP Autonet	No surcharge
In-WATS Access via ADP Autonet (per hour)	$ 19.00
Third-party Network Access (per hour)	6.50
International Access	Determined by Foreign Network
ADMINISTRATIVE CHARGES	
Monthly Account Charge (per directory)	$100.00
Optional Monthly User Summary Report (per report)	50.00
Optional Monthly Detailed Usage File (per file)	75.00

(A) One message segment contains space for 1,000 characters or the equivalent.

Table 3. Automail monthly charges.

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It requires an Asynchronous Host Interface Processor (AHIP) and a Host Communication Facility (HCF). An AHIP is an intelligent communications processor that provides ports for multiple asynchronous host or terminal connections. AHIPs are located at the client's site and are directly connected via an HCF to a communication center. Communication between the AHIP and Autonet is based on Autonet's packet-switching protocol, which includes end-to-end error control, alternate path routing, and automatic-answer dial backup facilities. An HCF consists of an access port, a leased channel, and the associated modems. AHIPs are available to support up to 80 users. A separate line is required between the AHIP and the host for each potential simultaneous connection. An AHIP can function as a terminal concentrator, providing access to the host from local asynchronous terminals. HCFs are available to support data transmission rates of 2400 to 14,400 bps. AHIPs are available throughout the continental United States.

X.25 Host Interface—X.25 is a second method of connecting a host computer to Autonet. The International Consultive Committee for Telegraphy and Telephony (CCITT) approved X.25 as the international standard protocol for packet-switching networks. X.25 Interface can support multiple simultaneous users through one communication line. The HCF is required for X.25 Interface. An HCF connects directly to the host or to a front-end processor and consists of an access port, a leased channel, and associated modems.

Also available is an *Interim HCF Service*, a short-term host interface arrangement that is initiated as needed by the client over a dial-up circuit. The service is a temporary solution to clients who do not wish to delay the start of service while permanent equipment is being ordered and installed. The Interim HCF Service is subject to the same traffic, connect, and administrative charges described in

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ADP Autonet

▷ the standard Autonet pricing schedule, and is available for a maximum period of 90 days. There is no installation charge.

An optional X.25 Host Interface Processor (XHIP) can provide up to 48 access ports for local asynchronous terminals. HCFs are available to support data transmission rates of 2400 to 14,400 bps. The X.25 Interface is available to users in the continental United States.

Table 2 (Page OL20-066-304) shows the Autonet price schedule for the host interface services, optional services, and other administrative charges.

In addition, ADP Autonet offers an X.75 Network Interface option. CCITT approved X.75 to permit data transmission between different data networks. ADP Autonet currently interfaces with such networks as Telenet, Tymnet, RCA Globcom, ITT TeleCom, and Telecom Canada Datapac.

VALUE-ADDED SERVICES

AutoMail is ADP's computer-based message system. Key features of the AutoMail service include sending and receiving messages via electronic mailboxes, security and private message handling, several types of address lists, electronic bulletin boards, built-in editing capabilities, Telex communications, and delegated message receipt where a support staff member can receive incoming messages for many users with a single command.

AutoMail applications include scheduling and confirming meetings, circulating important memos, and keeping information on file for instant access. AutoMail is now being used by major banking and financial institutions, government agencies, and manufacturers to distribute crucial information to member locations.

CUSTOMER SUPPORT SERVICES

Autonet provides its users with error-control features, alternate-path routing, and automatic-answer dial backup procedures to ensure accurate data transmission, and to minimize the effect of line or node failure. The Autonet Network Control Center provides 24-hour-a-day, 7-day-a-week monitoring to detect malfunctions and reduce service interruptions. The control centers are secured by fire control and uninterruptible power supply systems.

SALES AND MARKETING

Autonet clients are supported by a staff of network sales specialists and network consultants. For additional information, please direct all inquiries to ADP Autonet headquarters, 175 Jackson Plaza, Ann Arbor, MI 48106; Attention: Manager, Marketing Services. Regional sales offices are located in Ann Arbor, MI; Los Angeles, CA; Cleveland, OH; and Princeton, NJ. ☐

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Applicon

Applicon is an international company specializing in Computer-Aided Engineering (CAE), Computer-Aided Design (CAD), and Computer-Aided Manufacturing (CAM) products and services. A subsidiary of Schlumberger, Applicon incorporates the combined technology and expertise of two former entities: Applicon (Burlington, MA) and MDSI (Ann Arbor, MI)—both founded in 1969. The new Applicon, formed in July 1985, has headquarters in Ann Arbor, MI and maintains sales and service offices worldwide.

COMPANY INFORMATION

Applicon
4251 Plymouth Road
P.O. Box 986
Ann Arbor, MI 48106
Telephone (313) 995-6000

Company Background

Applicon offers a full range of CAE/CAD/CAM products and services for engineering and manufacturing applications such as product design, design analysis, tool design, process planning, NC programming, facilities layout, sheet metal fabrication, and quality control. Applicon was restructured in mid 1985, and the new company now subsumes the original Applicon as well as Manufacturing Data Systems, Inc. (MDSI). Applicon claims to have the largest number of installed workstations in the CAE/CAD/CAM industry as a result of the restructuring.

Applicon offers a complete range of hardware and software solutions tailored to the specific needs of companies in the Electrical, Mechanical, and Electromechanical markets. Applicon products such as the Mechanisms, Finite-Element Modeling (FEM), and Interference Analysis packages are designed to significantly accelerate the interactive engineering process to improve design and manufacturing. As a customer-driven company, Applicon helps companies implement CAE/CAD/CAM solutions in a modular manner based on their manufacturing needs and financial situation.

Applicon is backed by the resources of Schlumberger, a world leader in the development and application of artificial intelligence. These resources include research centers in Palo Alto, CA and Ridgefield, CT. Applicon reports that it is drawing on Schlumberger's expertise to create the next generation of CAE/CAD/CAM products.

Competitive Position

As a result of the mid 1985 restructuring that blended the complementary resources and products of Applicon and Manufacturing Data Systems, Inc. (MDSI), MDSI's product strength in the area of Computer-Aided Manufacturing has been combined with Applicon's experience in Computer-Aided Design and Computer-Aided Engineering. Consequently, the new Applicon feels that it is well positioned to address the needs of its targeted electromechanical market. According to the company, Applicon, backed by Schlumberger, is now equipped to develop the next generation of Computer-Integrated Manufacturing products and services. In addition, Applicon reports that it will be managed as a customer-driven company, and will listen closely to its installed base (more than 9,000 workstations) for direction regarding future product enhancements and developments.

Currently, Applicon places itself among the top five CAE/CAD/CAM (Computer-Aided Engineering, Computer-Aided Design, and Computer-Aided Manufacturing) companies in today's market. Furthermore, the company claims to have more workstations installed than any other vendor.

RESOURCES AND FACILITIES

CIM Labs

Applicon's CIM Labs are located throughout North America, Europe, and Asia, and provide first-hand evaluation of Applicon products.

Remote Computer Services

Applicon's Remote Computer Services Program is available through the company's international value-added network. The user needs only a telephone and terminal, and simply dials a local telephone number to gain access to Applicon's network.

Systems Software

OPERATING SYSTEMS: Applicon uses VMS, Micro-VMS, and MS-DOS operating systems. Standard operating systems are used on in-house minicomputers, as well as professional computers, standalone 32-bit workstations, and 32-bit VAX computers.

Microcomputer Software

Same as for Systems Software.

Customer Support Services

Applicon provides a full range of support services to customers under service contract. The services include the following:

- A full range of professionally taught training programs offered at convenient locations throughout the country.

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- Regular updates in technology.

- Field applications engineers near major cities. (A field engineer is assigned to the client prior to system installation to ensure a smooth start-up.)

- Customer toll-free hot line.

- Documentation, which, according to the vendor, is in the form of clear, easily referenced user manuals.

PROCESSING SERVICES

Pricing

Pricing information is available upon request.

INDUSTRY-SPECIFIC APPLICATIONS

Applicon's CAE/CAD/CAM solutions currently address these applications: product design, solids and Finite-Element Modeling, design analysis, tool design, process planning, facilities layout, NC programming, 3-D surface design and machining, and expert fabrication.

Product Design

The 2-D and 3-D design/documentation applications contain computer-aided drafting software that combines the simplicity of computer graphics with powerful drafting features. Drawings can be quickly created, stored, recalled, and edited. A unique menu approach guides the user through logical sequences to create geometry and to perform other visual operations to develop documents such as in-process drawings, setup sheets, and tooling sheets. Dimensions are automatically drawn with arrowheads and text showing precise measurements between selected drawing elements. Other key features include layering and cross-hatching. Commonly used shapes can be defined once and used in multiple drawings.

Solids Modeling

Applicon's advanced Solids Modeling II package provides capabilities for design, modeling, and visualization. Solid models clearly define an object's interior, exterior, and surface details, so that interferences are readily detected. Since solid models are geometrically complete, mass properties such as weight, volume, center of gravity, and mass moments of inertia can be extracted automatically with computer precision.

Finite-Element Modeling

An on-line Applicon Finite-Element modeler automatically generates a three-dimensional Finite-Element mesh on a design model for structural analysis applications. Model verification features, such as automatic shrinking of the mesh, help ensure that the analysis input is accurate. Depending on the model's size and complexity, analysis can be performed on-line or as a batch operation.

Design Analysis

Applicon offers Finite-Element and mechanisms analysis software. Users can interactively perform kinematic, mass property, and structural analyses to reveal potential interferences or structural deficiencies. The Mechanisms package calculates the static, dynamic, and kinematic behavior of planar mechanical systems. Applicon's graphical display feature permits designers to visualize the motion and travel of linkages, so that interference can be readily detected. The Finite-Element Analysis software displays results graphically, eliminating the tedious review of lengthy computer printouts. To permit the designer to understand the effects of vibration, an animation feature can be used to display model shapes.

Tool Design

The tool design application makes development of tooling quick and easy. Jigs, fixtures, clamping arrangements, and special tooling can be created and stored on the Applicon System for use in any tool design.

Process Planning

The process planning application allows the development of setup and process sheets. This enables the manufacturing engineer to integrate and communicate information created by the product and tool designers.

Facilities Layout

With the facilities layout application, facilities can be designed or rearranged for equipment and process flow changes. Using shape libraries, any facility shape can be designed, modified, or referenced for easy layout construction.

NC Programming

With the menu-driven NC application, users may incorporate their own machining methods or allow the Applicon System to apply efficient techniques. It has such automatic routines as lathe roughing, lathe grooving, lathe threading, mill contouring, point group drilling, pocketing, and clamp avoidance.

3-D Surface and Machining

The Applicon surface CAD/CAM application is a set of CAD/CAM tools designed for working with complex surfaces. It incorporates a true 3-D geometric modeler, a full 3-D tool path generator, and an NC/CNC machine tool processor. The geometric modeler provides a complete list of standard primitives and geometric building blocks. Automatic wire frame development and powerful surface-to-surface intersections are also included. The 3-D tool path generator integrates advanced manufacturing technologies to give users both flexibility and productivity in manufacturing complex systems. The System uses Applicon's extensive library of machine tool drives, capable of supporting virtually any NC/CNC machine tool.

Applicon

▻ Expert Fabrication

The Applicon fabrication CAD/CAM application addresses the manufacturing of fabricated parts. It incorporates expert technology into design, documentation, part fabrication, tooling, and machine tool support. Expert technology means that the system has built-in fabrication knowledge; it uses libraries to acquire knowledge; and, by using the new library information, it becomes more productive.

Applicon provides specifically tailored designing and punching routines that automate these tasks. Powerful design features include automatic isometric views, folding and unfolding capabilities, and flat pattern layout with standard or user-defined bend allowances. Fully interactive libraries for machine parameters, materials, and tooling provide an in-depth understanding of the fabrication process. The latest fabrication techniques are provided, including full punching, nibbling and blanking support, automatic punching of shapes and chained elements, and optimization of tool paths and cycle times with complete user control.

NETWORKING

Applicon provides communications in two vital environments: Factory Floor, and Engineering Office.

Factory Floor—A special Applicon network, which allows shop-floor personnel to communicate CAD/CAM data electronically to and from the engineering office.

Engineering Office—An Ethernet network, which allows design and manufacturing engineers to share common CAD/CAM data outside of their plants, even to their job shops. ☐

Boeing Computer Services (BCS)

COMPANY INFORMATION

Boeing Computer Services
2810 160th Avenue S.E.
Bellevue, WA 98008
Telephone (206) 763-5250

Company Background

Boeing Computer Services was created as a Boeing Company subsidiary in 1970. As a result, 13 separate computing organizations were consolidated within one organization. The new company began with a staff of 2,000 that had previously been supporting Boeing computer operations, and about $100 million of computer equipment. Boeing Computer Services expanded rapidly as the demand for remote computing services grew during the 1970s. In 1978, Boeing Computer Services became one of Boeing's operating divisions.

Today, Boeing Computer Services supports six Boeing Companies, as well as over 2,000 government and commercial customers, with a variety of information processing services. Boeing's commercial market consists of three functional areas: business management services, data processing services, and engineering/scientific services.

BCS is divided into four major groups:

- *Boeing Support Group* meets the data processing requirements of The Boeing Company and its operating divisions.
- *Commercial Services Group* markets remote computing services, network services, distributed information services, and systems development and consulting services.
- *Federal Systems Group* provides professional services and sales support for systems development, systems integration, and facilities management services to the federal government.
- *Software and Education Products Group* supports the Company's software products and education and training services.

Boeing Computer Services' customers include Fortune 500 companies, government agencies, major construction firms, and financial institutions.

Competitive Position

Although a company spokesperson declined to release revenue figures, the past 18 months or so have apparently been good to Boeing Computer Services. The company's employee base grew from 8,000 to 10,000—a 25 percent leap. In addition, BCS upgraded its already formidable hardware arsenal, with the addition of several new IBM mainframes, and another CRAY mainframe. BCS has also added to its store of database management systems, and substantially increased the number of mathematical and statistical packages, and engineering applications it offers. This growth is particularly significant because it comes at a time when many remote computing companies are diversifying into other areas, (e.g., software) in the wake of a lessening in the demand for remote computing services.

Boeing Computer Services, a division of The Boeing Company, offers products covering the full range of computer services. These services include interactive, batch and distributed processing, systems engineering and integration, systems development, facilities management, consulting, education and training, software products, and communication network management services. Many of these services, such as Boeing's EIS decision support system, were originally internal applications, and are now offered to outside customers as well.

Boeing Computer Services has more than 10,000 employees and $540 million worth of computing equipment, including two high-speed, state-of-the-art CRAY "supercomputers." In addition, Boeing Computer Services boasts one of the largest privately owned telecommunications networks in the world, employing landlines, microwave transmitters, and satellites with earth stations at each of its five major data centers.

Boeing Computer Services is in the process of reevaluating its menu of on-line database offerings. In the future, BCS will offer fewer economic databases, but will selectively add "large industry-specific databases," according to a company spokesperson.

RESOURCES AND FACILITIES

Processing Centers

Boeing operates five major data centers, linked together by its own network and several network control centers. Three of the five data centers—located in Kent, WA; Wichita, KS; and Philadelphia, PA—principally support Boeing operations in these geographic locations. The Kent data center is IBM-based and serves as headquarters of a remote services network for Boeing low- and medium-speed terminal users. Boeing's Seattle-Area Microwave System (SAMS), a private company network, is also located at Kent.

The fourth data center, located in Bellevue, WA, supports both Boeing and commercial customers with a variety of engineering and scientific information services. Bellevue is headquarters for two remote computing services: MAINSTREAM-EKS and MAINSTREAM-VSP.

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▷ The fifth facility, located in Vienna, VA, serves commercial customers. The Vienna Data Center supplies MAINSTREAM-CTS and MAINSTREAM-TSO remote computing services.

Boeing Computer Services operates data processing equipment valued at more than $500 million. Hardware used for commercial processing includes IBM 3081, 3083, 3084, 3033, and 4341; Cyber 760, and 875; and CRAY 2-S mainframes. The company also plans to install a CRAY X-MP 2400 in early 1985. Also, for fast I/O processing, a solid state storage device (SSD) with 128 million words—the largest of its kind—will be added. Disk and tape storage are supported at both the Vienna and Bellevue data centers. The Vienna Data Center also provides disk drum storage. Output devices include printers, plotters, and card punches. Microfilm and microfiche service are also available.

Systems Software

UTILITIES: BCS has significantly enhanced the operating systems it offers on MAINSTREAM to provide users with a rich variety of capabilities. In addition, Boeing offers the following utilities:

Editors

- CDC Edit
- CMEDIT
- Edit (CMS)
- Filedit (TSO)
- SPF
- Wylbur

Sorts

- CMS Sort
- OS/VS Sort/Merge
- Syncsort

United States

- Anchorage, AK
- Atlanta, GA
- Boston, MA
- Chicago, IL
- Dallas, TX
- Denver, CO
- Detroit, MI
- Greenwich, CT
- Harrisburg, PA
- Houston, TX
- Los Angeles, CA
- Morristown, NJ
- New York, NY
- Newport Beach, CA
- Philadelphia, PA
- Pittsburgh, PA
- Portland, OR
- San Francisco, CA
- San Diego, CA
- Seattle, WA
- Sunnyvale, CA
- Tulsa, OK
- Vienna, VA

Canada

- Calgary, ALTA
- Vancouver, BC

United Kingdom

- Coventry, England
- London, England
- Watford, England

Saudi Arabia

- Jeddah

Table 1. BCS sales office locations

LANGUAGES: BCS offers the following languages, compilers, and debugging aids:

- APL (IBM and CDC versions)
- Assembler
- Basic
- CAL
- CFT
- Cobol
- Cobol Interactive Debug
- Compass
- CTS Debug
- Cyber Interactive Debug
- Execution Diagnostic Facility (EDF/CICS)
- Fortran
- Fortran Interactive Debug
- Pascal
- PL/1
- Program Trace
- SIMSCRIPT
- Test
- Watfiv Fortran Compiler

Customer Support Services

The BCS four MAINSTREAM services are supported by a staff of experienced technical support personnel, available to help customers use the company's offerings efficiently and economically. BCS Technical Representatives provide no-charge assistance to resolve any processing problem. In addition, both the Bellevue and Washington Data Centers maintain a staff of senior specialists, skilled in conversion, optimization, and benchmarking of user programs.

Boeing Computer Services also maintains a Quality Assurance organization, responsible for the control of BCS products and services. It assures the client that all services meet standards of excellence for reliability, function, usability, and performance. This organization also ensures the validity of converted, redesigned, and new software, as well as data files.

Sales and Marketing Services

Boeing Computer Services maintains sales offices in the cities listed in Table 1.

PROCESSING SERVICES

Boeing Computer Services delivers its remote computing services via MAINSTREAM, a series of data processing service vehicles that perform in either interactive, remote batch, or over-the-counter batch mode. MAINSTREAM services target the business management, data processing, and engineering markets with four distinct processing environments.

- MAINSTREAM-CTS—used primarily for interactive program development, execution of interactive programs, and business and database applications. MAIN- ▷

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STREAM-CTS operates on large-scale IBM hardware under control of a BCS-enhanced version of IBM Virtual Machine Facility/370 (VM/370).

- MAINSTREAM-TSO—this processing environment is an advanced computing system designed primarily for large-volume batch processing and interactive program development. MAINSTREAM-TSO operates on large-scale IBM hardware under the control of the IBM Operating System/Virtual Storage (OS/VS2) with Multiple Virtual Storage/Extended Architecture (MVS/XA).
- MAINSTREAM-EKS—designed for the scientist, researcher, statistician, or engineer, the MAINSTREAM-EKS processing environment runs on multiple CDC Cyber large-scale computers. Both interactive and batch processing modes are available. IBM front-end processors provide remote access with multiple protocols.
- MAINSTREAM-VSP—this delivery vehicle uses CRAY processing to provide specialized, high-speed computing especially designed for vector and scalar processing. MAINSTREAM-VSP is accessed through the job submission and interactive facilities of the CDC and IBM processing environment.

APPLICATION-SPECIFIC SERVICES

Business/Financial

BA/Basic—a comprehensive set of quantitative, interactive programs used in financial forecasting and investment analysis. Its routines cover such areas as spreadsheet analysis, break-even analysis, investment analysis, data generation, and maintenance.

Cash Control—provides analysis and control techniques for effective cash management. The system is used by bank corporations to consolidate cash receipts and disbursements of their member banks into management reports. These reports provide analysis of fund levels of each member bank within the corporation.

Cuffs—provides its own financial, mathematical and statistical functions, as well as a facility to construct user-defined functions. Cuffs is an interactive software system that helps the corporate planner design, implement, and maintain financial models tailored to specific requirements.

Currency Conversion—provides access to daily, monthly, and yearly currency exchange rate information for 30 world currencies. Information can be displayed in tabular and graphical report formats.

Dart—a financial software system providing easy access to Standard and Poor's Compustat II corporate and industrial databases. The system features easy data retrieval and screening, report writing, and 70 precalculated ratios.

Datagraf—a data analysis tool, this software package integrates interactive access and databases with graphic and statistical capabilities. Datagraf merges desired information with programs that let the user manipulate and present the resulting data in whatever way is most appropriate.

Econoscope—an economic analysis and forecasting system designed for the noneconometrician. The Econoscope system is made up of detailed economic databases and programs that enable the user to access information about national economic categories. The program also allows users to manipulate, alter or add data, or create their own data files.

EIS (Executive Information Services)—a management-oriented decision support system predominantly designed to handle timespread data, budget planning, financial planning, and performance forecasting. An interpretive English-based command language allows even nonprogrammers to communicate their needs quickly and easily. EIS comprises a family of services designed and built to operate as one integrated system. Each feature may be used independently or in conjunction with other features. EIS features include the following:

- Database management
- Graphics
- Financial applications, including the solution of simultaneous equations
- Modeling
- Financial forecasting and statistical libraries
- Report writing

EIS interfaces with other systems such as INQUIRE, APL, SAS, Cuffs, and Ramis II.

EIS Financial Library—supports a wide variety of financial applications that reduce the time, effort, and cost of constructing financial models from scratch. These include the following:

- Capital investment analysis
- Purchase/lease schedules
- Depreciation schedules
- Loan schedules
- Interest rate alternatives
- Foreign currency conversion
- Internal rate of return analysis
- Backward iteration

Evans Economics Electronic News Service—accessed via microcomputer or standard terminal, this service provides a unique combination of historical data, forecasts, analysis, and commentary on a range of economic and financial issues.

Paus—a risk analysis modeling system that allows users to quantify the uncertainty of an event and then evaluate the profit, return on investment, cash flow, or any other computation.

Data and Database Management

ADRS—provides complete control of titles, headings, comments, and data appearing anywhere in a report. ADRS

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▷ also provides fast turnaround and easy modification of existing report formats and data. Common procedures, such as routing reports to a high-speed printer, sorting columns, selecting rows, and performing calculations on rows and columns, are built into the system. ADRS interfaces easily with other programs.

Creatabase—a proprietary software product of NDX Corporation, Creatabase is an integrated system for operating multiple databases. It is particularly effective for extensive, complex, arbitrary queries on very large databases.

Easytrieve—an information retrieval, file management, and report generation system available on BCS' IBM-based systems. Easytrieve can be used to produce reports from any number of input files, onto any of a variety of output media.

EIS Database—allows the user to store both historical and forecasted data at all intersections in monthly, quarterly, semiyearly, or yearly intervals. EIS Database is oriented to time series data.

Eisquire—an interface between EIS and Inquire. With Eisquire, detailed business and financial data may be stored in one or more Inquire databases and retrieved using Inquire capabilities. Data retrieved from Inquire is automatically written to EIS to update the EIS database.

EXCL—an EIS application program allowing users to extract and convert externally created computer source data and then load it with EXCL commands into an EIS database. EXCL can be used for transferring data from a number of sources to EIS for such purposes as financial planning and forecasting, appropriations, and zero-based budgeting.

Ezdata—an interactive BCS software package that helps users to quickly define and construct a database with the aid of dimension-by-dimension, account-by-account, prompter messages. An output report function provides graphic and tabular formats and can display selective detail or summary-level data from the three dimensions specified in the database.

Focus—a product of Information Builders, Inc., Focus is an easy-to-use fourth generation database management and information control system, which can be used to perform financial modeling, decision support, statistical analysis, queries, graphics, and reporting.

IDMS—a Cullinet product available on BCS' IBM-based systems, IDMS is a database management system designed to conform with the Codasyl database task group language specifications.

IMS/VS DB—a data management facility developed by IBM and used for medium- and large-database needs. It provides all the necessary functions for IMS database definition, creation, access, and maintenance. In addition, IMS/VS DB allows the user to integrate, share, and control common data, thus reducing data inconsistencies.

Inquire—an integrated database management system from Infodata Systems, Inc. available on IBM mainframes at BCS. Inquire allows users in batch or interactive modes to create new databases and to query and report from one or more databases without writing programs. Databases can be created independently, and can be logically related when queries are executed.

Intellect—a data retrieval language that enables users to interact with a computer by use of everyday, conversational English.

System 2,000—a general-purpose database management system that provides capabilities for developing complete information systems with a hierarchial structure. An English-like language provides retrieval and update capability against the data in the database. Capabilities include:

- Definition modification
- Assorted data types can be defined—Integer, floating point, text, date, arrays, etc.
- Data overflow within a field (element)
- Storage of user-defined command sets (strings)
- Security to the field level
- Data sorting before output
- Text searching (character string search within an element)

All commands can be qualified to select a subset of the data. The database is created by describing its hierarchial structure and various characteristics of the data elements. Indices and pointers are created automatically as data is loaded or updated through System 2,000 to its internal format files.

Panvalet—a direct-access library system consisting of programs that address both programmer and management needs regarding the source program library. Panvalet provides centralized storage of source programs and data, easy program maintenance, and card-image retrieval via interactive or batch access.

PRO/grammar—an information retrieval and application development system. Using English-like syntax and simple declarative statements, users can produce comprehensive reports. PRO/grammar allows the more experienced data processing professional to generate application software to perform complex programming tasks.

Ramis II—a complete database management system offering quick access to information and providing a sophisticated tool for managing data resources. Ramis II offers generation and formatting of reports; management of records; access to the database using Fortran, Cobol, PL/1, and Assembler; graphics capability; and interfaces with EIS.

BCS RIM—a relational database management system that permits the dynamic definition of data relationships, providing the flexibility to handle small or large problems of any complexity. BCS RIM provides a powerful, easy-to-use, English-like command language to define, load, and ▷

query the database. It supports database access through application programs for integration into a standalone system. The report writer option permits the user to create special reports for either one-time or continued use. Because of its availability on multiple hardware systems, BCS RIM provides unparalleled database portability. The system UNLOAD command permits data transfer within one computer or between mainframes, minicomputers, and microcomputers. Specific features support the use of BCS RIM with scientific/engineering applications, including support of matrix, vector, and double-precision data.

System 2,000/80—a database management software product from Intel Corporation that is used by BCS on large-scale IBM systems. System 2000/80 incorporates the Quest English-like query/update language, and provides Plex (Programming Language Extensions) that allows Cobol, Fortran, PL/1, or Assembly language programmers to combine the organization and storage benefits of the database with the procedural language of the host programs.

SIR—a statistics-oriented database management system based on SPSS.

Program Development Aids

BCS offers Interactive Program Development (IPD) a family of software and communications services using large-scale computer hardware to improve programmer productivity in the development and testing of large database and data entry systems for either on-line or batch processing. IPD provides on-demand, prime-time computer resource availability and access to a number of software development and prototyping tools, all structured around IBM compatibility. Some of the IPD software available includes:

- *DMS*—a productivity development tool available under CICS that simplifies the implementation of on-line systems through use of the 3270 Information Display System. Developed by IBM, it consists of a set of preprogrammed facilities that provide such functions as: terminal display management, DL/1 database and file management, and message routing.
- *DMS/CMS*—an application development tool developed by IBM that enables the user to interactively define screen formats and field definitions. Using DMS/CMS, the user can design panels (screens) for 3270 terminals, to allow communication with these screen images from application programs or Exec procedures.
- *SDF*—an application development productivity tool developed by IBM that simplifies the process of Basic Mapping Support (BMS) map definition. SDF provides the utility functions required to define, maintain, and test maps and map sets.
- *SPF*—provides a wide variety of programming and editing functions. SPF helps display terminal users with tasks ranging from data entry to writing applications and maintaining sophisticated program libraries.

Mathematics and Statistics

APEX-III—an efficient mathematical programming system for solving linear and mixed-integer problems found in industrial and financial modeling.

BCSLIB—a library of mathematical, statistical, and utility subprograms, providing basic coverage of all significant areas of numerical mathematics. These areas include elementary and special functions, interpolation and approximation, polynomials and nonlinear equations, quadratic and differential equations, linear algebra, probability and statistics, optimization, and time series analysis. Also included in BCSLIB are such utilities as array sorting, I/O support, and character string manipulation.

Box-Jenkins Time Series Analysis—provides the capability for developing models for short-term forecasts, and offers a variety of statistical techniques for estimating future values.

Vectorpack—an expanding collection of CRAY Assembler Language (CAL)-coded, Fortran-callable subprograms that provide basic building blocks for scientific applications on the CRAY computer. Vectorpack currently contains 54 user-callable subprograms for performing dense vector operations, sparse vector operations, matrix operations, discrete Fourier transforms, discrete convolutions, and sorting.

EIS Statistics—contains a large collection of statistical routines, including regression analysis, time series analysis, analysis of variance, correlation matrix, nonparametric tests and matrix, and data manipulation.

GPSS V—a general-purpose program developed and maintained by IBM that is used for the simulation or modeling of discrete systems. It provides a means to examine the behavior of such systems and to make a judgment on inherent interrelationships.

MPSX/370—a mathematical programming system that solves linear and separable programming problems. It uses the revised simplex method (LU form of the inverse) with free or bounded variable and range constraints. Typical applications include material allocation, ingredient blending, production planning, investment analysis, and capital budgeting, as well as plant/warehouse location, machine loading, work force allocation, distribution planning, and combinations of these applications.

PDS/Magen—a Problem Descriptor System Matrix Generator that adds flexibility and expanded capabilities to the mathematical programming system, APEX-III. PDS/Magen provides an efficient method of producing a linear programming model and reports. The PDS module permits dynamic model maintenance and revision, database control, all Fortran functions, index nesting, and generalized report production.

SAS—provides data and file management, statistical analysis, high-resolution graphics, full-screen data input, utility functions, report writing, and econometric and forecasting functions.

SPSS—a completely integrated system of statistical programs for a wide range of data analysis applications in business, government, scientific, and academic research. Using simple commands, users may access a comprehensive set of statistical procedures for data analysis as well as a full range of data and file management capabilities. Efficient, and easy to learn and use, it eliminates the need for programming in many data analysis problems.

Typical applications include:

- Marketing research studies
- Economic analysis
- Advertising research
- Engineering data analysis
- Medical research studies
- Equal opportunity studies
- Personnel studies
- Ecological studies
- Pharmaceutical research
- Affirmative Action data analysis
- Business applications
- Cost analysis

Statpk—an interactive statistics package that performs required calculations for most small- and medium-size statistical problems. Statpk contains over 20 individual processing and statistical routines.

Engineering

BCS provides a variety of applications software products that support such engineering activities as structural design, reservoir modeling, and mathematical and statistical analyses. The engineering systems provide solutions to complex engineering problems in many industries, including energy, manufacturing, and construction.

ADLPIPE—ADLPIPE performs stress analysis of complex three-dimensional piping systems. Analysis capabilities include:

Static Analysis

- Thermal
- Gravity
- External forces and moments
- Acceleration
- Wind
- Pressure

Dynamic Analysis

- Frequency and mode shape extraction
- Multiple response spectra
- Time history model superposition

Thermal Transient Analysis

ADLPIPE provides stress analysis and stress reports according to the requirements of the latest ANSI and ASME codes. Free format data entry and interactive plotting capabilities help the user input and correct data.

Ansys—a structural and heat transfer analysis program developed and maintained by Swanson Analysis Systems, Inc. Ansys employs finite element technology for the solution of several classes of engineering analysis problems.

Blast—the Building Loads Analysis and System Thermodynamics program was developed by the U.S. Army Construction Engineering Research Laboratory. The program determines space heating and cooling loads by the thermal balance method and simulates a variety of air-handling systems and central energy plant components. Life-cycle costs are then determined and compared for each central energy plant option.

Capdet—developed by the Army Corps of Engineers, Capdet is a comprehensive planning level tool that helps civil, sanitary, industrial, and municipal engineers select cost-effective wastewater treatment systems. The version supported by BCS has been updated to meet Environmental Protection Agency (EPA) requirements.

CASMO-2—a multigroup two-dimensional transport theory code for burnup calculations on BWR and PWR assemblies or simple pin cells. The code handles a geometry consisting of cylindrical fuel rods of varying composition in a square pitch array with allowance for fuel rods loaded with gadolinium, burnable storage rods, cluster control rods, in-core instrument channels, water gaps, boron steel curtains, and cruciform control rods in the regions separating fuel assemblies. Typical fuel storage rack geometries can also be handled.

Blazer—converts the fluid parameters of the Relap family of nuclear codes into force-time histories used by structural analysis codes like Nupipe, Tpipe, E3SAP, Ansys, Stardyne, and Nastran. With Blazer, both the structural and the thermal/hydraulic implications of loss-of-coolant incidents can be explored. Blazer is part of a new library being developed jointly by BCS and the Energy Engineering Computer Code Laboratory.

DOE-2—designed for HVAC engineers who are not necessarily programmers, DOE-2 computes building energy consumption. It uses an English-like input language to drive five separate program modules: BDL (Building Design Language) translates the input language into computer commands; Loads calculates the amount of heat entering or leaving the building; Systems simulates secondary

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equipment such as ventilators and air handlers; Plants simulates primary energy conversion equipment such as boilers and chillers, determining their life-cycle costs; and Economics prepares a life-cycle cost for an alternative system.

Ease2—performs linear elastic finite element analysis. Both static and dynamic analyses are available with eigenvalue extraction, response spectrum analysis, and transient response analysis through direct integration or mode superposition techniques. The system has an input processing module, a plot program, a time history/response spectrum processor, and several post-processor programs.

Easy5—simplifies dynamic response and control system analysis of complex systems described by nonlinear ordinary differential equations. Easy5 is especially well suited to interdisciplinary analyses, where considerations involving hydraulics, mechanical design, thermodynamics, or stress analysis meet in the same system. Easy5 is intended for consulting engineers, process control engineers, and system analysts.

E3SAP—performs linear, static, and dynamic analysis of engineering structures and piping systems. E3SAP offers comprehensive structural capabilities while providing an easy to learn and use problem-solving method. It evaluates a wide variety of framed structures, plates, and shell structures, solid bodies, and axis symmetric structures.

E3SAP is Boeing Computer Services' version of SAP IV, which was developed at the University of California. It incorporates extensive modifications and enhancements that provide greater convenience, improved utility, and lower cost solutions.

Modifications have been made to allow a distributed axial load capability for beams.

FIDAP—a general-purpose fluid dynamics analysis package that uses the finite element method to simulate many classes of incompressible fluid flows. Two-dimensional, axisymmetric and three-dimensional steady-state or transient simulations in complex geometries are possible with the analysis limited in size only by practical considerations of computer time, and the ultimate capacity of secondary storage devices.

Analytical capabilities include:

- Isothermal Newtonian or non-Newtonian flows
- Free, forced, or mixed convection problems
- Advection-diffusion problems, velocity field fixed in space and time
- Atmospheric flows
- Creeping flows (molten glass and metals)

Steady or transient analyses of all the above problems are possible, and the same FIDAP model can be used for different types of analyses. Program features include:

- Boundry conditions
- Volumetric forces
- Time integration and solution techniques
- Fluid property models
- Element library

Force—takes thermal hydraulics parameters from transient analysis codes like RELAP4, and RELAP5, and generates forces in the various mode positions in the piping network to create a file of information for input to further dynamic structural and analysis codes. This file of FORCE time history is part of the input needed by structural codes like E3SAP, ANSYS, TPIPE, NUPIPE, and ADLPIPE. The data transfer from transient analysis code is automated, as is the plotting of the transferred data that is relevant to the physics of the problem.

FORCE allows specification of an "open"-ended or "closed"-ended node, in addition to the normal end. It also allows a reduction of the number of time points to be treated by either cutting it off at a time point less than the total, or by specifying a "skip" number by which time points are skipped per every force output. In the skipping mode, local peaks and valleys in the FORCE-time history are preserved.

GTSRUDL—developed and marketed by the Georgia Tech Research Institute for CDC computers, GTSTRUDL is a general-purpose program that assists structural engineers in preparing data, managing structural engineering information, controlling analysis and design processes, and displaying and interpreting results.

HEC-2—a hydraulic analysis program originally developed at the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. The Center provides continuing maintenance and enhancement of HEC-2. The HEC-2 program performs computations of the water surface profiles for natural or modified river courses and other open channels.

KENO—a multigroup Monte Carlo criticality program that solves the Boltzman neutron transport equation using Monte Carlo methods. The best results calculated by KENO include: K-effective lifetime and generation time, energy-dependent leakages and absorptions, energy- and region-dependent fluxes, and region-dependent fission densities.

Marc—a general-purpose finite element system providing capabilities for solving a wide range of structural analysis problems. A software product of Marc Analysis Research Corporation, the system includes a library of elements and a selection of material behaviors, both linear and nonlinear. The Marc System can be used for linear elastic analysis of two- and three-dimensional solids, shells and beams, and for applications in which nonlinear material and geometric effects dominate and must be included in conjunction with sophisticated geometric modeling.

Nastran—originally developed by the National Aeronautics & Space Administration (NASA), Nastran is a very

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powerful, general-purpose, structural analysis program. MSC/Nastran, as offered by BCS, is an updated version, developed and maintained by the MacNeal Schwendler Corporation. MSC/Nastran employs the finite element analysis technique, and provides a comprehensive selection of linear, elastic problem solutions.

Nupipe—one of a family of pipe stress analysis programs incorporating nuclear power and petrochemical industry analysis standards. Nupipe can be used for stress analysis caused by static and dynamic loadings, thermal transients, pipe rupture, and pipe whip. The Nupipe library consists of NupipeII, Trheat, Prthrust, Piperup, Piplot, and Ruplot.

ORIGEN—an isotope generation and depletion code that solves equations of radioactive growth and decay for large numbers of isotopes with arbitrary coupling.

Relap—the Relap codes (Relap 4/5, 4/7, 5/1, and N) model water-cooled nuclear reactors subjected to coolant losses, pump failure, or power excursions. They calculate fluid conditions, thermal conditions, energy distributions, and heat fluxes in power generating and dissipating elements. The programs also calculate reactor power, decay heat, and reactivity.

SETS—SETS (Set Equation Transformation System) is a general program for the manipulation of Boolean operations that can be applied to fault trees and used to find minimal cut or path sets. The advantages of the set code are its generality and flexibility. For example, users may dynamically manipulate the tree via SETS user programs with correspondingly greater control over the processing. This feature can be especially helpful when analyzing trees. A SETS user program may be written to decompose the original tree, and process it in stages without requiring any changes to the original fault tree input description.

SETS can handle complemented events, exclusive "JR" gates, and special gates represented by any valid Boolean expression defined by the user. It can be used to find the prime implicants (a more general term than minimal cut sets, including the possibility of having both an event and its complement in a Boolean equation) of any intermediate gate. It allows tree reduction based on both cut set order and cut set probability. It will also rank and print the minimal cut SETS in order of descending probability (assuming basic event probabilities have been input). It can also be used for common cause analysis by inputting generic cause susceptibilities for each basic event.

Sail II—a language used to describe basic finite-element input data such as gridpoints, element connections, and loads. It provides simple, straightforward techniques for describing algorithms to generate blocks of data, allowing users to take advantage of any pattern or sequence that occurs in the data.

Stardyne—this structural analysis system consists of a series of compatible programs for the static and dynamic analysis of structures. The static capability includes the computation of structural deformations and member loads and stresses caused by an arbitrary set of thermal, nodal applied, and prescribed displacement loads. Using direct integration or the normal mode techniques, dynamic response analyses can be performed for a wide range of loading conditions, including transient, steady-state harmonic, random, and shock spectra excitation types.

Supertab—a proprietary product of Structural Dynamics Research Corp., this BCS offering is an interactive graphics program for the preparation of nodal coordinate and element connectivity data for finite element analysis programs. Supertab creates models interactively from a graphics terminal, displays the structure as the model building progresses, and creates data files which are readable by finite element structural analysis programs.

Systems Professional (SYSPRO)—a library of special-purpose programs that allows engineers with little or no computing experience to use the MAINSTREAM-EKS system for structural analysis. Individual SYSPRO programs analyze steel columns, beams, column base plates, welded girders, and composite beams. Masonry analysis programs can help design piers, bearing walls, retaining bulkheads, and shear walls. In addition to the programs that work with structural elements, another set of programs performs analysis of connected structures, rigid frames, trusses, shear wallframe interactions, and wind and earthquake loads. SYSPRO programs are upgraded continually and conform to the latest Uniform Building Codes. Steel and concrete programs conform to AISC and ACI codes.

TERRALOG—an interactive system of log analysis routines that operates in realtime, using a conversational link between user and machine. It consists of eight primary modules that allow:

- Data input, retrieval, modification, and display
- Estimation of proportional lithologies
- Reservoir analysis
- Multivariate statistical and time series analysis
- True vertical depth calculation
- Graphic log correlation
- Dipmeter analysis

TERRALOG can be used by oil and gas and mineral exploration companies for formation evaluation. Typical applications include:

- Determination of water saturation
- Hydrocarbon characteristics
- Porosites
- Lithologies
- Lithofacies analysis
- Dipmeter analysis
- Synthetic seismograms
- High-speed reservoir characteristic determinations

Tpipe—a special-purpose program capable of performing static and dynamic linear elastic analyses of small- or large-scale power and nuclear piping systems.

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VIP TM—the first numerical reservoir simulator designed and developed for maximum efficiency on vector processing computers. With this tool, a reservoir engineer can quickly and economically predict the response of an oil or gas producing property to a variety of operating conditions or development plans.

The underground flows of oil, gas, and water are calculated with finite difference methods using one-, two-, or three-dimensional grids. Since either rectangular or cylindrical grid networks may be used, VIP TM efficiently solves both single well and field scale production problems.

VIP can be used to:

- Design a drilling program to maintain a desired oil production rate.
- Determine the incremental oil that can be recovered by means of pressure maintenance with water or gas injection.
- Determine when water treatment facilities or artificial lift will be required.
- Evaluate the feasibility of storing gas in an aquifier.
- Select the optimum perforated intervals for a well by predicting its water and gas coning tendencies.
- Interpreting pressure drawdown and buildup tests for wells flowing at pressures below the bubble point.

Watsim—a water distribution network simulation program originally developed by System Control, Inc., for the U.S. Department of the Interior. Watsim simulates flow in pressure conduits and other hydraulic structures to facilitate the design of water distribution systems.

Graphics

BCS offers the following software for graphic output to support financial planning, engineering, and other uses.

Bigs—a high-level, Fortran-callable, subrouting package providing fully interactive graphics for engineering, scientific, and business applications.

CRTPLOT—offered through APL, CRTPLOT provides high-quality CRT graphics for users of Tektronix 4010 Series terminals. These include functional (X-Y) plots, bar charts, and pie charts. The user has complete control of the plotting environment and can easily override the defaults to specify scaling, labels, annotations, size and position, as well as other cosmetic features.

Dazyplot—an APL-based terminal graphics package for daisywheel terminals that provides plotting capabilities for functional (line) and bar charts, and scatter diagrams. Dazyplot also features log, semilog, and polar scaling; automatic interpolation; and many options to improve the design of plots and charts. The user can override preset defaults to create complex plots.

Disspla—a graphics system from Integrated Software Systems, Corp., Disspla includes a powerful package of Fortran routines that allows the graphics user almost complete output device independence. The graphic output from the system can go to any vector-mode output device, which includes most plotters, microfilm recorders, and CRTs that are designed to work with two- and three-dimensional output. The system is designed to operate with most of the used axis systems, including linear, semilog, log-log, and polar.

EIS Graphics—provides the capability of producing both simple and sophisticated graphs on display terminals, pen plotters, and daisywheel terminals. Graphic options include horizontal and vertical bar charts, pie charts, horizontal and vertical stock market charts, and logarithmic and semilogarithmic graphs.

GDDM/PGF—produces high-quality color graphics. GDDM and PGF complement each other, in that GDDM provides a variety of basic graphic subroutines, capable of complete graphic and alphanumeric screen and printer control. PGF provides a high-level interface between the calling program and the GDDM routines used for constructing charts. GDDM/PGF can produce the following types of charts: line graph, scatter plot, surface chart, histogram, bar chart, pie chart, and Venn diagram.

Graphs and Histograms (APL)—a plotting package written in APL and developed by IBM, used to plot curves, bar charts, and histograms; convert data to a corresponding frequency distribution; or combine several sets of data into the proper input form for the functions being plotted. A high-resolution plotting capability is available for 2741-type terminals.

Tell-A-Graf—Integrated Software Systems, Inc. is the producer of this conversational computer graphics system, using simple English commands to produce publication-quality charts and graphs. Tell-A-Graf includes preprogrammed bar, line, and pie charts with automatic scaling, layout, and animation.

Text Processing

Documentation Composition Facility (DCF)—a comprehensive text processing product used to support the creation of printed material in a computer environment. DCF uses Script/VS codes to format text material such as program and user documentation, form letters, price lists, legal briefs, and manuscripts. DCF provides the user with complete control over the printing function. Some of the features of DCF include:

- Page layout capabilities
- Automatic generation of table of contents and index
- Spelling check
- Tab settings to handle automatic tabbing
- Floating text to the top or bottom of page or column
- User interaction during processing
- Integer arithmetic performed during processing
- Variable fonts

Boeing Computer Services (BCS)

NETWORK SERVICES

The Boeing Network offers commercial customers PO 1 grade service—no more than one busy signal per 100 attempts to access Boeing's remote computers. Local dial access is available from virtually every major city in the U.S. INWATTS service covers areas without local dial access. International access to MAINSTREAM computing facilities is available through a Telenet interface.

The Boeing Network supports synchronous and asynchronous protocols using ASCII or EBDIC character sets. Network access can be gained by using TTY and compatible units at 10, 30, or 120 cps; IBM 2741 and compatible units at 4800 bps; or 3270-type terminals. Batch terminals supported include IBM 2780, 3780, 360/20, 1130, 6670, or any other HASP RJE unit. Supported microcomputers include those that exercise the ASCII protocol, emulate 3270 operation, act as RJE protocols, or use BCS' BITS software.

The Boeing Network facilities are engineered, installed, and maintained in coordination with national and international common-carrier designated account managers. A Boeing Computer Services staff of over 400 network professionals evaluate, plan, and implement the application of new communications technologies.

SNA Network Services (SNS) is a group of network products and services designed for SNA users.

SNS is designed to support any terminal that meets SNA specifications as released by IBM.

SNS provides customers with three logical SNA network possibilities:

- Using the Boeing SNA network alone;
- Using the Boeing SNA network to supplement an existing SNA network;
- Using the Boeing SNA network to interconnect two or more existing SNA networks using SNA INTERCONNECT. SNA INTERCONNECT provides a single physical link between an SNA network and the Boeing Network. The interconnection of numerous SNA devices to an existing network allows access to many different applications.

Within these three logical SNA network structures, SNS provides a variety of connection capabilities, including:

- Terminal Connections—Customers can access attached application subsystems on MAINSTREAM services or on their in-house hosts.
- Host Connections—This allows customer terminals to communicate with customer hosts. Or, it allows customer hosts to communicate with each other. In addition, customer hosts can communicate with MAINSTREAM services hosts.

The SNA User Interface is a part of SNS that is visible to end users. It provides security features to protect the network from unauthorized use. It also contains customized screens for logging on, and menus for selecting application subsystems.

In addition, Boeing Computer Services provides consultation to help customers determine what implementation of SNS would be most benefical and cost-effective for their organizations.

ON-LINE DATABASES

Boeing Computer Services offers three on-line databases as part of its MAINSTREAM service.

Currency

Currency Conversion—part of EIS, this database provides access to daily, monthly, and yearly currency exchange rate information for 30 world currencies.

U.S. Economic

Econoscope—provides economic information and enables statistical modeling in an interactive environment. Econoscope is used by administrators, planners, marketing personnel, and the financial industry to determine the effect of the U.S. economy on their particular business segments.

EIS Economic Data—provides commonly used time series, an access routine for time series selection, and a reports library for output.

OTHER PROFESSIONAL SERVICES

Software Services

A BCS service offering, *Showcase*, provides software authors with the capability to develop, support, and maintain their software, as well as market, price, and promote it. BCS installs the production version and displays the application in a nationwide, on-line catalog.

In addition, BCS has developed and markets the following software products:

- EIS (Executive Information Services)
- Boeing RIM
- Craypack
- Boeing Data Entry System
- Boeing Document Transfer System
- Easy 5
- FIDAP
- BCSLIB
- Boeing Calc
- MMS (Maintenance and Materials Management System)
- PMS (Production Management System)
- Test Equipment Inventory (TEIMS) Management System
- Scholar/Teach 3, a computer-based instruction package
- Facts
- The Boeing Tutorial Series

Boeing Computer Services (BCS)

⊳ Microcomputer Software/Services

BCS offers *BITS*, a family of software modules that enables a microcomputer to act as a business workstation or as an intelligent terminal for connection to a remote computing service. Of the eight separate software workstations that constitute BITS, the Intelligent Terminal Software Workstation is the basic system around which the remaining seven are built. It contains the control program, a screen editor, and a standard teletype TTY telecommunications capability for BITS-to-host or BITS-to-BITS communication. Other BITS workstations consist of two data entry modules, three business management modules, a text processing software module, and an EIS/ODC module. The BITS operating system is hardware independent.

Integrated Systems

EIS MicroWorkstations—PC-based service offerings that aid the financial planner. Featuring the processing capabilities available with EIS, Boeing's fully integrated decision support system, one workstation is a bundled, distributed system linking micro to mainframe. The second workstation is a software and services offering implemented on the PC XT/370. It features the powerful modeling and forecasting capabilities of the host-based EIS command language for desktop batch or interactive processing.

Micro/8410 Workstation—a distributed data processing system designed specifically for structural analysis applications, this workstation links an MDX 11 microcomputer with MAINSTREAM remote computing service mainframes. The Micro/8410 is the first in a family of workstations Boeing is designing for the engineering and energy industries.

Education and Training

Boeing Computer Services offers more than 60 regularly scheduled courses reflecting the latest developments in hardware and software. Major training centers in Seattle, San Francisco, Chicago, Dearborn, New York, and Washington, DC are fully equipped to give students hands-on instruction in technical subjects. ☐

Bowne Information Systems

Bowne Information Systems was established in 1969 as Bowne Time Sharing. During the early years of its corporate life Bowne offered a single service—time-shared text editing. Although Bowne still offers its text-editing service (called Word/One) the company has undergone many changes since 1969. Bowne now views itself as an information management and computer printing company. In addition to its database typesetting and demand printing services, Bowne is the exclusive vendor of SPECTEXT (the construction industry's master guide specification). In August 1983, Bowne was acquired by TSR, Inc., a New York-based public corporation providing computer timesharing, mainframe, and microcomputer consulting, and other professional services.

COMPANY INFORMATION

Bowne Information Systems
400 Oser Ave.
Hauppauge, NY 11788
Telephone (516) 231-0333

Company Background

Bowne Information Systems (BIS) was established in 1969 as a subsidiary of Bowne & Company. During that same year, BIS introduced its Word/One text processing service, which was subsequently adopted by both federal and corporate clients. In August 1983, BIS was acquired by TSR Inc., a "leading edge" supplier of computer services, which claims to be one of the fastest growing publicly held timesharing companies.

Today, clients and prospective clients view BIS as an information management and computer printing company. The text editing and records management software, the large-scale processing power, the telecommunications networks, the device-to-machine compatibilities, the demand laser printing, and computer typesetting technologies, when coupled with BIS' staff resources in the programming, technical, and project management areas, combine to form a unique information management and publishing offering.

BIS is a prime vendor of computer-stored specification services, and is the exclusive vendor for SPECTEXT, the industry specification sponsored by the Construction Sciences Research Foundation. BIS also offers a comprehensive system for the Production and Control of Employee Benefit Books and Summary Plan Descriptions. In addition, Bowne Information Services is a major supplier of database typesetting and demand printing services through its Videocomp computer typesetter, and its Xerox 9700 laser printers.

Competitive Position

Although the past 18 months have been a period of transition for Bowne, the company appears to have emerged from the storm leaner and more competitive. Since TSR Inc. acquired it in August 1983, Bowne has been able to improve the quality of its products, according to Marketing Manager Robert Cohn. Bowne is now capitalizing on TSR's resources to further develop and promote its SPECTEXT service, which is the accepted master guide specification for the construction industry. Bowne is also concentrating its efforts on its LaserType and demand printing services.

RESOURCES AND FACILITIES

Processing Center

Bowne Information Systems, is headquartered at Hauppauge, NY, and shares the computer resources of TSR Inc. These resources are available to users from 1 a.m. to 12 p.m. Eastern Time, seven days per week.

Sales and Marketing Services

Bowne Information System offices are located in Chicago, Los Angeles, New York City, San Francisco, and Washington, DC. Each office is staffed with high-level professionals who are knowledgeable not only in BIS' services but also in all aspects of text processing and related services.

APPLICATION-SPECIFIC SERVICES

Bowne Information Systems offers services in the following specialized areas:

- Computer typesetting
- Compliance document manufacturing
- Litigation support
- Master specifications
- Correspondence management
- Word processing (service bureau)
- Electronic printing
- Records management
- Micropublishing (specifications)

SPECTEXT, the construction industry-accepted master guide specification, is available on floppy disk exclusively from BIS. This Construction Specification Institute (CSI) database streamlines the specification writing process for designer/specifiers. BIS offers an ever-expanding range of services to SPECTEXT subscribers. SPECTEXT is avail-

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Bowne Information Systems

▷ able in both WordStar and DisplayWrite 2 format for over 160 microcomputer systems. It may be used with several of the most popular operating systems including: PC-DOS, MS-DOS, and CP/M.

Employee Benefits Control System is a production system for managing and distributing variable employee benefit plans. Using the clients own word processing equipment, benefits books are maintained on BIS' Records Management System, electronically typeset using the company's LaserType composition system. The benefits books are then printed using BIS' Xerox 9700 laser printer, and packaged and distributed via BIS' service department.

Benefits books are prepared on-demand in large or small quantities, guaranteeing cost-effective production and distribution.

To support these specialized services, BIS developed a series of proprietary software systems, which are described below.

Mag-Media is representative of BIS' developed software that makes conversion from on-line master database to diskette easy. BIS can offer Mag-Media support from its mainframe computer to over 160 different microcomputer and word processor formats.

Word/One is a BIS proprietary software system for interactive text editing and demand publishing. The system enables a user to enter, format, display, and publish free-form textual information, and to use powerful editing and text reorganization capabilities.

Word/One stores information for immediate on-line access. The system provides communication between any or all Word/One terminal operators. In addition to supporting low- and medium-speed terminals, Word/One supports the use of high-speed upper- and lowercase laser and conventional printing devices. Security against unauthorized system usage and document retrieval does not preclude shared data and access when desired. Magnetic tape direct-access storage enables off-line archival storage, backup, and recovery along with intersystem data exchange.

KeySearch is an interactive records management software system, designed to deal with the complex concerns of information retrieval. KeySearch functions include:

- Selecting documents by key words, phrases, synonyms, root words, ranges, or codes
- Sorting documents on-line
- Editing document bases, including adding, changing, or deleting documents

The KeySearch records management system is geared toward firms that process and subsequently interrogate textual information. It has proven to be particularly useful in the area of computer-based litigation support.

Mailpac enables users to input a name and address list, and to maintain this list using normal Word/One text processing capabilities. In addition, the terminal operator has the following input options: the ability to duplicate specific lines from one name and address record to another by typing a single character; the ability to type only the state abbreviation, as defined by the United States Postal Service and have this abbreviation expanded to the full state name; and the ability to mix nonaddress ("ghost") material with the address information. This nonaddress information can be suppressed when output is produced.

Mailpac can check the name and address file document for possible error conditions, such as too many lines, too few lines, too many characters on a line, an improper state abbreviation, or an incorrectly entered zip code. The system prints out the results of the check indicating the name and address record(s) where a potential error exists along with the type of potential error.

Through Mailpac, users can also print pregummed and Cheshire-type labels from a file on either the high-speed or the laser printer. One-up labels can be printed at the terminal. The terminal operator has several options, including printing or suppressing the "ghost" information, producing up to nine duplicate labels with a single command, and generating labels printed one-, three-, four-, or five-up on the high-speed printer.

BIS has been in the business of typesetting information for more than 10 years through *Photocomp.* Photocomp is widely used in business and professional offices, primarily as a network service in combination with the Word/One text editing capability. Typically, users enter data into Word/One for editing and modification, and then stream it into Photocomp for final typesetting. For example, a manufacturer could store pricing information on a BIS system and generate up-to-date typeset price lists as needed through the network. Professional offices prestore boilerplate information and, under terminal control, assemble and typeset customized proposals and presentations. Banks use the system to store procedure and policy information and then generate final fully composed pages on-demand, ready for printing.

Photocomp offers the following features:

- Word processing compatibility: Text typed on office equipment is used to typeset a document. A variety of word processors and office typewriter can access and use Photocomp, including those by IBM, Exxon, Xerox, Raytheon, Lanier, and CPT.
- Galley and camera-ready pages: The system can typeset both galley pages for proofing and camera-ready pages for printing.
- Next-day turnaround: Whether the user is producing 20 pages or 200 pages, Photocomp documents are frequently returned on the next business day.
- Typesetting features: The system provides a full range of typesetting features including font and point size selection, incremental line spacing, text width specifications, automatic hyphenation, and ligature insertion.
- Multiple column capability: Photocomp composes pages ▷

Bowne Information Systems

containing multiple columns, tables, automatic footnotes, and running headers and footers. These capabilities eliminate much of the cut and paste associated with page make-up.
- English language instructions: Photocomp formats documents using simple instructions that are typed along with the document text prior to using Photocomp.
- Laser printing: The production of high quality typewriter font (mono spaced) printing providing a choice of: single or multiple copies, one sided or two sided, one of 5 fonts, portrait or landscape, draft or final, and a variety of paper or forms.
- LaserType: This is the marriage of Laser printing and page composition. LaserType offers the convenience of laser printing with much of the quality of typesetting.
- Storage and archival capabilities: The document can be stored and maintained in the BIS System and additional copies can be produced on demand.

NETWORKING SERVICES

Bowne's computers are part of an electronic network which links BIS' regional offices and more than 300 network customer office sites. Dial-up services are provided, along with the use of Tymnet networks. The network supports the following protocols: Correspondence, BCD, EBCDIC, ASCII, IBM 3270, and 2770 EBCDIC.

OTHER PROFESSIONAL SERVICES

Database Printing Service Bureau

In addition to its on-line services, BIS offers its clients the option of using its special software/hardware facilities on a service bureau basis. BIS will accept a 9-track tape or diskette and transform information on it to fully formatted typeset pages (including tabular material and headers and footers). BIS can also produce copies using its Xerox laser composition and printing systems. Typical applications have included setting rates tables for insurance companies; demand printing of street lists and election documents; and printing customized letters to client customers and prospects. The Bowne Service Bureau is equipped to handle large-scale, one-time, or repetitive project work.

FUTURE PLANS

Bowne Information Systems is dedicated to all areas of text processing. Immediate plans call for continued enhancements to current services designed to make offerings more attractive to target markets. □

Bradford National Computer Services (BNCS)

Bradford National Computer Services (BNCS) was established in 1976 and is a subsidiary of Bradford National Corporation, a publicly held corporation traded on the American Stock Exchange. In addition to acting as a processing service to the parent company, BNCS provides other users the following primary services: time-sharing, remote processing, systems design and development, consulting, and disaster recovery. Applicational specialties of BNCS include: accounting, banking and finance, payroll, data communications, database management, education, government, and medical and health care.

COMPANY INFORMATION

Bradford National Computer Services
1500 Palisade Avenue
Teaneck, NJ 07666
Telephone (201) 833-1020

Company Background

Bradford National Computer Services (BNCS) was established in 1976 and is a subsidiary of Bradford National Corporation, a publicly held corporation traded on the American Stock Exchange. The company was originally formed to provide data processing services for the parent company and other subsidiaries, but has expanded by offering its services to external industry. IBM and IBM-compatible facilities at BNCS support remote job entry, on-site batch submission, and high/medium-speed communication lines. Application expertise includes data management and database management in the financial, government, education, medical, and general-industry fields.

Additional services encompass facilities management, consulting, systems design and development, time-sharing, and disaster recovery. The BNCS facility is available 24 hours a day, 7 days a week.

As a supplier of processing services to the parent company, BNCS computers handle the recordkeeping functions for more than $50 billion of securities for financial institutions on a national basis. BNCS also provides payroll and human resources services.

BNCS has approximately 143 full-time employees, including 36 persons in finance/administration, 68 in operations and technical support, 5 in client support, 3 documentation specialists, 20 in systems and development, and 11 in marketing and marketing support.

RESOURCES AND FACILITIES

Processing Center

The BNCS computer center is located in Teaneck, New Jersey. The key equipment contained in the center is as follows:

Mainframe Processors

- 2 IBM 370/3033 Models U16 and U12 (28 megabytes of storage)
- 1 IBM 370/158 Model 3 (6 megabytes of storage)
- 2 directors
- 1 byte multiplexor channel per director
- 5 block multiplexor channels per director

Magnetic Tape

- 4 IBM Model 3803 tape control units
- 28 IBM Model 3420-6 tape drives (6250/1600 BPI)
- 1 IBM Model 3420-3 tape drive (1600/800 BPI)

Direct Access Storage

- 3 IBM/Memorex Model 3674 Storage Control Units
- 4 IBM/Memorex Model 3676 Storage Control Units
- 4 IBM Model 3880 Storage Control Units
- 32 IBM/Memorex Model 3650 Disk Drives
- 56 IBM Model 3350 Disk Drives
- 56 IBM/Memorex Model 3652 Disk Drives

Data Communications

- 4 IBM Model 3705 communication controllers

Systems Software

OPERATING SYSTEMS: BNCS uses the following operating system software:

- MVS/SP 1.3.0.—IBM with the Installation Productivity Option (IPO).
- JES2 Version 4.1—IBM, including the JES2 Spool transfer program.

TAPE MANAGEMENT: BNCS tape management systems include:

- UCC-1 TMS—University Computing
- TMS Batch Inquiry (TMSBINQ)—University Computing

COMMUNICATIONS: For system-oriented communications, BNCS provides:

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Bradford National Computer Services (BNCS)

- IBM 3705
- ACF/VTAM—IBM 2.0
- ACF/NCP/VS—IBM 1.2.1

CUSTOMER INFORMATION CONTROL: Offerings from BNCS include:

- CICS/OS/VS Version 1.5—IBM
- CICS 3270 Simulator—IBM
- CICS Dynamic Map—IBM
- CICS Dataset Recovery Facility (DSNREC)—IBM
- CICS PARS—IBM
- DL/1
- Intertest—On-line Software International
- User Files On-line (UFO)—Oxford Software

DATABASE MANAGEMENT: The following software supports BNCS applications in database management.

- Model 204
- IDMS Release 5.7—Cullinet
- Librarian—Applied Data Research

SYSTEM MEASUREMENT/TUNING: BNCS provides its users with the following systems:

- Resource Management Facility (RMF2)—IBM
- Look—Applied Data Research
- Total System Analyzer (TSA)—Boole and Babbage
- Configuration Utilization Evaluator (CUE)—Boole and Babbage
- Data Set Optimizer (DSO)—Boole and Babbage
- Problem Program Evaluator (PPE)—Boole and Babbage
- On-line Program Development—Roscoe—Applied Data Research
- UCC Duo

PROGRAMMING LANGUAGES: Programming languages offered by BNCS include:

- Assembler
- Autotab
- Cobol
- Easytrieve
- Fortran
- PL/1
- Scan

Customer Support Services

BNCS has five staff professionals assigned to customer support services. These individuals are well versed in the application and programming disciplines required to support the BNCS network.

Sales and Marketing Services

BNCS has 11 employees dedicated to marketing and market support, and all sales are handled out of the home office in Teaneck, NJ.

APPLICATION-SPECIFIC SERVICES

BNCS services are broad based, and cover the following applications.

- Bond clearance
- Corporate stock transfer
- Disaster back-up and recovery
- Equity clearance and drafting
- Facilities management
- Health and accident insurance
- Hospital management consulting
- Inventory control and recordkeeping
- IRA-Keough plan trust and accounting
- Medicaid
- Medicare
- On-line payroll/personnel
- Personal asset management
- Personal trust accounting
- Professional standards review organization
- Remote computing services
- Security custody services and recordkeeping
- Telephone monitoring/billing system

Payroll and Human Resources Service

BNCS recently introduced its on-line Payroll and Human Resources Service. The service is completely integrated, and can be accessed 24 hours a day through most microcomputers.

NETWORKING SERVICES

BNCS has a nationwide data communications network of leased and dial-up lines which support interactive and remote job-entry traffic through four 3705 controllers. In addition to 750 dedicated terminals in the network, there are 13 remote data processing centers using Bradford's centralized computer utility.

ON-LINE DATABASES

BNCS supports no on-line public databases, although its clients proprietary databases are on-line and available for client processing.

OTHER PROFESSIONAL SERVICES

Local Batch Services

BNCS offers local batch servicing of clients data processing needs at the data center facilities. All jobs must be designed and implemented to run in an IBM environment.

Consulting

BNCS has a number of well-qualified individuals who provide consulting services in systems design and development.

Bradford National Computer Services (BNCS)

Disaster Recovery Services

BNCS offers two disaster recovery services. The Application Backup Center (ABC) service allows subscribers to run critical applications at BNCS in the event of a secondary disaster. The Complete Recovery Service (CRS) is BNCS' total service, for subscribers faced with a major catastrophe.

FUTURE PLANS

BNCS, as the only supplier of data processing services to the parent company, has a vast amount of experience in the financial, government, and health fields. The division is currently examining alternative means of capitalizing on this experience, and thus plans to expand its offerings to outside users. □

The Computer Company

The Computer Company of Richmond, VA offers time-sharing services to the banking, energy, and transportation industries. The Computer Company offers its customers a greatly enhanced version of IBM's APL.SV for program development applications. Applications are available in the banking and finance, data management and database management, energy conservation and management, and management sciences areas.

The Computer Company has also developed APL.68000, the first APL interpreter for the Motorola 68000 microprocessor. APL.68000, a significant achievement in M68000 software support, is the first APL interpreter allowing full-screen applications that are machine independent.

Numerous on-line databases are available on The Computer Company system, with special emphasis on databases for the transportation and energy industries.

COMPANY INFORMATION

The Computer Company
Interactive Database Systems Division
1905 Westmoreland Street
Richmond, VA 23230
Telephone (804) 358–2171

Company Background

The Computer Company offers its customers time-sharing and batch programming facilities on an IBM 3033 and an Amdahl 470/V6. The Computer Company provides ACTION/APL.SV, an enhanced version of IBM's APL.SV, allowing customers even more versatility in their APL systems.

The Computer Company's ACTION/APL.SV enhancements to IBM's APL.SV are included in their APL.68000 microprocessor interpreter product. APL.68000 is the first APL interpreter developed for the Motorola 68000 microprocessor, and offers sophisticated APL versatility on any 68000-based microcomputer.

RESOURCES AND FACILITIES

Processing Centers

The Computer Company's main processing center features an IBM 3033 with 16 megabytes of main storage and an Amdahl 470/V6 with 10 megabytes of storage.

The IBM 3033U16 features the following:

- 16.384 million bytes of main memory
- 2-byte multiplexer channel
- 14-block multiplexer channel

The Amdahl 470V/6 provides the following:

- 10.24 million bytes of main memory
- 1-byte multiplexer channel
- 6-block multiplexer channel
- 1 selector

The two systems provide backup capability in that all disks are switchable by any string combination; all tapes are switchable in any combination; all unit record devices are switchable in any combination; and all TP controllers are also switchable.

A front-end teleprocessor and dedicated lines permit access to The Computer Company computers. The Tymnet public packet network provides local dial-up service from a number of cities.

An IBM 3705 provides front-end teleprocessing support and provides access to both the production time-sharing system and a test version of the time-sharing system. Special software supplied by Comm-Pro, Inc. allows ASCII terminal support with three user-selectable translate tables. Only low-speed asynchronous terminals can be connected to the time-sharing system through the 3705; block-mode transmission for 3270-type terminals is provided through dedicated lines.

Remote printer/card reader RJE stations can directly access the IBM operating system (but not the time-sharing system) through the 3705. Two 4800 bits per second (bps) bisync lines in Richmond handle 2780, 3780, and HASP multileaving protocols.

The APL Division communications hardware consists of:

- Bell Dataphone II
- Codex Modems
- Infotron Time-Division Multiplexers (TDM)
- Infotron Statistical Multiplexers

Systems Software

OPERATING SYSTEMS: The Computer Company's IBM 3033 and Amdahl 470/V6 CPUs run IBM's state-of-the-art operating system, MVS/SP, in a loosely coupled environment that allows backup in the event of processor failure.

JES2 allows dial-up RJE stations to supply passwords, thus protecting a user's output from being printed by other users and further protecting the system from unauthorized usage.

The Computer Company

The Computer Company's ACTION/APL.SV time-sharing system, a heavily modified version of IBM's APL.SV Release 3.0, supports a number of system-level features, including:

- ASCII terminal support
- Error-trapping and handling
- APL-oriented file system called ACTION/Files
- Fast data search and replace primitives
- Overlays
- Execution of system commands under program control
- Extended formatting for commercial applications
- Delimited blank removal primitive
- Comments and code on same line
- Shared variable processors
- Automatic symbol table cleanup
- Delimited vector-to-matrix and matrix-to-vector primitive
- Warm-start capability
- A mechanism for submitting batch jobs from the time-sharing system

UTILITIES: In addition to the usual range of IBM support utilities, The Computer Company provides its users with a library of Assembler language subroutines and programs that transfer data between ACTION/Files and OS/MVT datasets; APL/EBCDIC character code translation is usually performed during these transfers.

The ACTION/Files system provides both time-sharing users and batch programs easy access to 1.4 billion bytes of on-line storage. Batch programs can use special access subroutines developed to permit time-sharing terminal-type access (read, write, delete, etc.) of APL files.

A library of plotting software provides interfaces to Qume/Diablo high-resolution daisywheel printers, as well as non-plotting terminals. Tektronix APL software is available for Tektronix 4013/4015 vector-plot CRT terminals and Tektronix penplotter terminals.

PROGRAMMING LANGUAGES: The APL/HASP interface provides a number of batch programming languages and program products, including:

- PL/1
- Cobol
- Fortran

Customer Support Services

Customer support services include programming, analysis, and consulting services. Introductory, intermediate, and advanced-level APL courses are available.

Sales and Marketing Services

The Computer Company provides sales offices in the following cities:

- Houston, TX
- Los Angeles, CA
- Richmond, VA

APPLICATION-SPECIFIC SERVICES

Data and Database Management

A Database System (ADS)—an interactive maintenance program for small- to medium-sized, record-oriented databases (200 to 15,000 records). ADS makes it easy to program many common business applications, from user interfaces to report specifications, in days rather than weeks, and includes facilities to selectively retrieve, format, sort, summarize, query, print, and graph data from the specified files.

Management Sciences

Finanseer—a conversational financial planning and modeling system which can store, modify, analyze, retrieve, format, print, and graph financial data, as well as prepare statistical forecasts and schedules on stored, and forecast data. Finanseer provides a number of predefined programs, including cash flow projection, income statement development, product mix analysis, break-even analysis, budgeting, manpower planning, and debt structure analysis.

X–Pert—an interactive project management system suited for maintenance, construction, and development projects in any industry. X–Pert features include on-line editing and reporting; multiple calendars; schedules in graphic or tabular formats; and predefined user reports showing progress, resource usage, and resource conflicts. Custom X–Pert report formats are very easy to specify.

The Industrial Maintenance Management and Control System (TIMMACS)—a maintenance management system designed by The Computer Company for small- to medium-sized companies. TIMMACS is a fully integrated system composed of eight types of maintenance information: equipment inventory, work order tracking, preventive maintenance, resource scheduling, resource inventory, standards development, equipment maintenance history, and management reporting.

Complete Asset/Liability Management System (CALM$)—a comprehensive, interactive system which integrates all phases of asset/liability management and budget management, including creation of your chart of accounts, definition of relationships among accounts, entry and updating of budget/actual numbers, "What if" analysis, and a variety of financial reports.

INDUSTRY-SPECIFIC SERVICES

Banking

Midas—an interactive system that is used to analyze data on banking services, deposit information, and automated teller transactions for participating banks and savings and loans. Data is available for California and Washington. The Computer Company offers predefined and custom report formats in their on-line environment; printed reports are available for nontime-sharing customers.

The Computer Company

Transportation

Airmarket—a conversational applications language used to retrieve, analyze, format, print, and graph time series data contained both in The Computer Company databases and in user databases. Available data includes financial and traffic data submitted to the C.A.B. by U.S. commercial air carriers and data from the Department of Energy and the American Petroleum Institute, showing petroleum import, production, and stock information. Airmarket includes predefined reports; special consulting services and custom reports are also available.

Netod—the O & D Network Market Analysis Report system uses Summary O & D Data and Form 298C Data to show certified carrier and commuter carrier information for specified markets. Markets may be defined simply as a single city-pair or, in a much more complex manner, as service between regions. Information on the Netod report shows international data, as well as U.S. data, and includes origin information, destination information, passenger data (for commuter carriers), and computed market share statistics for each carrier in the specified market.

Microcomputer Software/Services

APL.68000—a full implementation of The Computer Company's enhanced APL.SV based on the Motorola 68000 microprocessor. APL.68000 is a fast and powerful APL interpreter that allows development of full-screen applications that are machine-independent. APL.68000's new Version 4.0 also offers a run-time version for increased software development. APL.68000 currently runs on more than 20 microcomputers, including Apple Lisa, IBM CS9000, IBM PC, Apollo, Fortune, and Wicat.

NETWORKING SERVICES

Access to The Computer Company computers is through the Tymnet public packet network in most major cities. Houston and Richmond further support local 1200 bps ASCII terminals through Bell 212A and Vadic 3452 modems. Richmond also supports 300 bps access with Bell 303/313 compatibility.

ON-LINE DATABASES

The Computer Company offers a number of on-line databases geared to the energy, airlines, and rail and trucking industries. Detailed information on most of these databases may be found in the On-line Databases section (OL40) of this publication.

Energy

Oil Imports—contains information corresponding to the U.S. Department of Energy Office of Oil Imports monthly "Petroleum Statement" of the Mineral Industry Surveys. Information includes Federal Energy Data System data on consumption by product and district, production and stocks of crude petroleum, refinery input and output, refinery stocks, pipeline stocks, bulk terminal stocks, finished petroleum products imports, plant condensate imports, and unfinished oils imports.

Transportation

The Computer Company's transportation databases, of special interest to the Airlines and Rail and Trucking industries, are described below.

Form 41—contains data from 1968 to the present for more than 20 financial, cargo, performance, and traffic statistics for U.S. commercial carriers and more than 800 airports. Data is from that submitted by all U.S. certified carriers to the Civil Aeronautics Board. Financial data includes balance sheets, operating statements, income statements, transport revenues, taxes, payrolls, G&A expenses, inventory, stockholders' equity, and invested capital.

Origin & Destination—contains data from 1972 to the present for domestic and international directional summary passenger statistics. Data includes total number of inbound and outbound passengers, mileage, revenue passenger miles, number of connecting passengers, number of local passengers, market share statistics, rankings of city-pairs by total passengers, and rankings of city-pairs by revenue passenger miles. Preformatted market analysis reports are available.

Commuter—contains data from 1969 to the present detailing passenger, mail, freight, mileage, and market share data for U.S. commuter carriers who submit Report 298 to the Civil Aeronautics Board. Preformatted market analysis reports are available.

ER–586 Service Segment—contains data based on Economic Regulation 586–Service Segment reports detailing information on international and domestic directional passenger, mail, and freight data for all flights flown in scheduled service by large U.S. carriers. Information includes load factors, traffic statistics, quality of service indicators, passenger statistics, extra-section flights, and nonscheduled flights. A waiver from the C.A.B. is required for access to the ER–586 Service Segment database. Preformatted analysis reports are available.

OTHER PROFESSIONAL SERVICES

In addition to time-sharing and batch processing services, The Computer Company offers the following:

- Programming, analysis, and consulting; programmers, communications analysts, senior analysts, and consultants are available
- APL training courses with one instructor assigned to each 15 students; introductory, intermediate, and advanced-level courses available
- Data entry services which produce data suitable for loading to an Action/File

The Computer Company

- ▷ Other time-sharing/batch processing-related services, including tape storage; bursting, decollating, and other printer-output services; postage, courier service, and shipping services; special handling by computer operators; punched card supplies; and 600-foot and 2400-foot magnetic tape supplies

The Computer Company also offers the Branch Data Exchange (BDX), a voluntary exchange of data among participating financial institutions. Actual data exchanged includes deposit information, such as NOW accounts and various terms of certificates, loan data, ATM transaction data, and credit card data. Participants receive quarterly or semiannual printed reports that reflect the performances of branches, trends in the marketplace, and market share developments.

The Computer Company's Micromedia Division produces microfilm and microfiche from customers' print images stored on magnetic tapes. It is one of the largest computer-output microfilm centers on the East Coast. □

Computer Corporation of America (CCA)

Computer Corporation of America (CCA), founded in 1965, is a leader in database and information management. Comet, the first commercial electronic mail product, was introduced in 1978, and is available today as a public service or as an in-house system. Model 204, the only system to be originally designed as an on-line Database Management System, is licensed commercially by CCA, and is also available as a service from a number of CCA customers.

COMPANY INFORMATION

Computer Corporation of America (CCA)
Four Cambridge Center
Cambridge, MA 02142
Telephone (617) 492-8860

Company Background

Computer Corporation of America (CCA) is a computer software and services company. Founded in 1965, CCA specializes in commercial software products for database management, application development, end user computing, and office automation.

In addition to these commercial products, CCA offers custom software development in the areas of data management and communication, distributed processing, and office automation.

CCA's Comet Electronic Mail System has been available as a public service for over six years, and currently supports several thousand subscribers worldwide. A monthly subscription plan enables users to access this service from their own terminals from anywhere in the United States, as well as from most other countries. Users can also license the Comet software to run on their own in-house IBM mainframes or DEC PDP-11s.

Model 204 Database Management System (DBMS) is offered as a time-sharing service by a number of CCA's commercial customers. Model 204 provides multikey access with rapid response, flexibility in data organization, and safeguards for the privacy of data.

CCA revenues for 1983 were $22 million; the company employs approximately 350 people.

RESOURCES AND FACILITIES

Processing Center

CCA's Comet service operates on dual DEC PDP-11s located at its headquarters in Cambridge, MA. This service can be accessed from domestic and international locations using Direct Distance Dialing (DDD) at 300 or 1200 baud, as well as through Tymnet or Telenet.

The public service is available 24 hours a day, seven days a week. Users can select any ASCII terminal—fixed or portable, hard-wired or acoustic-coupled, video, or hard copy. Start-up time is minimal; users can be operating on the service within one day.

The Comet System currently supports several thousand subscribers worldwide. Using 14 simple commands, these users can compose, edit, transmit, distribute, and file messages in a fraction of the time it would take to send a business letter.

Systems Software

Although CCA uses DEC's RSX operating system to provide its on-line services, the users do not need to learn any aspects of system software in order to use CCA's on-line service.

Customer Support Services

Fifteen support employees are dedicated to developing and maintaining the Comet Service. In 1983, subscribers enjoyed a 99 percent Comet up-time during prime hours (7 a.m. to 9 p.m.). Total Comet up-time, including preventive maintenance, was over 90 percent.

A Comet Hotline Service is available for subscribers to report problems or ask questions.

The monthly charge for the Comet Service is $60 per mailbox. Customers with 25 or more mailboxes qualify for a discount plan.

For the Model 204 Database Management System, CCA provides extensive documentation and training. Although CCA does not offer the Model 204 DBMS as an on-line service, several of CCA's customers make this product available as an on-line service. Some of these are:

- AMS (Arlington, VA)
- Comnet (Washington, DC)
- Datacrown (Willowdale, Canada)
- Informatics (Canoga Park, CA)

Sales and Marketing Services

CCA has 125 marketing and sales employees located in its Cambridge, MA headquarters and branch offices. In addition to the headquarters, CCA representatives can be reached at the locations shown in Figure 1.

Tables 1, 2, 3, 4, and 5 provide the various price schedules for Comet.

▷

Computer Corporation of America (CCA)

CCA U.S. Locations

- Orange County, CA
- Arlington, VA
- New York, NY
- Houston, TX
- Chicago, IL
- San Francisco, CA
- Hartford, CT
- Rochester, NY
- Atlanta, GA
- Dallas, TX
- Saddle Brook, NJ
- Stamford, CT
- Philadelphia, PA
- Santa Monica, CA
- Denver, CO

CCA International Affiliates

- Japan
- United Kingdom
- Canada
- Australia
- Saudi Arabia
- France
- Switzerland
- Italy

Figure 1. U.S. and International locations of CCA sales and support offices

APPLICATION-SPECIFIC SERVICES

Data Communications

Comet—a computerized person-to-person communication system, capable of message preparation, filing, retrieval, and distribution control. Designed to be used by managers and professionals from terminals on their desks, Comet reduces the time, cost, and problems associated with executive communications. Users can create a form template on a Comet terminal and store it in an electronic file. When needed, the form can be quickly retrieved, completed with the necessary data at the terminal, and then sent to the predesignated electronic mailbox or mailboxes. This eliminates the errors and delays traditionally associated with the human handling of corporate forms. New features of Comet's text editor simplifies the process of composing messages at the terminal. Users can edit and reuse already existing messages. In addition, new features allow users to rearrange the sequence of words, sentences, and paragraphs within existing text. This allows messages to be edited more quickly.

Monthly Charge for Standard Usage of Comet Service:

$100 per customer organization (billable account).

$60 per individual subscriber within customer organization.

Service is cancellable on 30 days notice.

Standard usage includes up to 9 hours of connect time and up to 500 messages stored.

Additional Usage:
Connect time: $7 per hour
Storage: $0.02 per message per month

Documentation Supplied:
One complete documentation set per billable account. One Quick Reference Guide per subscriber.

Additional user manuals available at $5 per copy.

Common Carrier Charges:
Any common carrier charges incurred by the customer in accessing Comet will be billed to the customer directly by the carrier or passed on to the customer by CCA at cost.

Table 1. Comet Service Charges

Customers with 25 or more mailboxes can reduce their Comet service costs through the Equity Plan. With the Equity Plan, customers pay a one-time initial fee based on the number of mailboxes they plan to use. After that, monthly costs are cut by two-thirds from $60 per mailbox per month to $20.

Mailbox Capacity	Price
25	$10,000
50	$18,000
100	$25,000
200	$30,000
300	$35,000

Standard usage includes up to 9 hours of connect time and up to 500 messages stored.

Additional Usage:
Connect time: $7 per hour
Storage: $0.02 per message per month.

Documentation Supplied:
One complete documentation set per billable account. One Quick Reference Guide per subscriber.

Additional user manuals available at $5 per copy.

Common Carrier Charges:
Any common carrier charges incurred by the customer in accessing Comet will be billed to the customer directly by the carrier or passed on to the customer by CCA at cost.

Terminals:
CRT or hard copy terminals are available for rent or purchase.

Table 2. Comet Equity Plan

Users can connect to CCA's Comet service on a monthly subscription plan. This subscription service is accessible from anywhere in the United States, Australia, Canada, England, France, Italy, or Switzerland. For in-house processing environments, Comet runs on IBM series 360/370, 303X, 4300, and plug-compatible systems, as well as on DEC PDP-11s.

Data and Database Management

Model 204 Database Management System—offers multi-key access with rapid response, flexibility in data organization, and safeguards for the privacy and integrity of data. Some Model 204 features are:

	Delivery and Installation	Monthly Rental
Video Terminals:		
DEC VT-100	$ 75	$114
Lear Siegler ADM3A	75	72
Printing Terminals:		
TI-745 (portable)	$ 50	$100
DEC LA-34 (table top)	75	88
DEC LA-36	100	119
Optional Modems and Couplers:		
Acoustic coupler; 1200-baud	$ 50	$ 54
Direct connect modem; 300- to 1200-baud	50	51

Note:
Rental period is three-month minimum. Monthly price includes 300-baud modem (coupler).

Table 3. CCA's Comet User Terminals Price Schedule

Software License Fee for DEC PDP-11:	
One-time charge	$40,000
License Fee Includes: Installation, documentation (one set), user-training class. (Out-of-pocket expenses of installation and user training not included.)	
Maintenance Contract: (cancellable on 30 days notice)	$450 per month
Maintenance includes: Corrections and enhancements to software system, updates to documentation, and Hotline service (provides answers to questions and help in using Comet system).	
Documentation:	
User Manual	$ 5
Technical Manual	$25
User Training:	
One Day at Customer Site	$500+expenses
Hardware: DEC PDP-11 minicomputer configured to customer requirements.	
Terminals: CRT or hard copy terminals are available for rent or purchase.	

Table 4. Comet DEC Environment License Fees

- Rapid retrieval for on-line queries
- Data relationships defined dynamically as needed
- The ability to change the number of fields and field size, allowing for open-ended application growth
- Security procedures protect the privacy of databases, and allow different access privileges to accommodate different types of users
- Simultaneous on-line and batch access to the same data
- Used directly by Cobol, PL/1, Fortran, and Assembler programs
- Efficient management of large and small databases for growth without performance degradation
- Full report writing capabilities available within the user language
- Databases can be accessed or updated from any number of remote terminals
- No programming background is required to construct user language requests

Software License Fee for IBM 360/370, 303X, and 4300 Series Main Frames:	
One-time charge	$60,000
License Fee Includes: Installation, documentation (one set), user-training class. (Out-of-pocket expenses of installation and user training not included.)	
Maintenance Contract: (cancellable on 30 days notice)	$750 per month
Maintenance includes: Corrections and enhancements to software system, updates to documentation, and Hotline service (provides answers to questions and help in using Comet system).	
Documentation:	
User Manual	$ 5
Technical Manual	$25
User Training:	
One Day at Customer Site	$500+expenses
Terminals: CRT or hard copy terminals are available for rent or purchase.	

Table 5. Comet IBM Environment License Fees

- May be used with BTAM, TCAM, VTAM, CICS, Intercomm, and TSO

Mail/204—brings together two proven capabilities: the Comet Electronic Mail System for executive communications and the Model 204 database management system. Mail/204 is designed to operate with a wide range of operating systems used by System/360, System/370, or compatible computers. The Mail/204 system operates like the Comet system that runs on DEC PDP-11 computers operating under RSX-11M and RSX-11M Plus. The system is terminal-oriented, with less than 20 one-word commands. These include:

- Compose
- Edit
- Send
- Scan
- Read
- Answer
- File
- Retrieve

Additional Comet functions are available for forwarding messages, setting up distribution lists, and managing access controls.

Workshop/204—an integrated set of software productivity tools for the application developer. Workshop/204 is on-line, and operates as an integrated subsystem of Model 204 Database Management System for IBM mainframes. The tools provided for development tasks are:

- *DB Designer*—designs databases automatically
- *User Language*—develops production applications
- *Developer*—automatically generates prototype and end-user applications
- *Painter*—defines screens and forms
- *Dictionary*—provides complete documentation and control of data
- *PC Checker*—verifies syntax and commands at the PC level

MICROCOMPUTER SOFTWARE/ SERVICES

Intelligent Information Center—a group of decision support and productivity tools linking end users and computers. The end-user computing tools available include:

- *PC/204*—an easy-to-use PC/mainframe link for automatic spreadsheet definition and creation
- *ACCESS/204*—a menu-driven decision support query and report writer
- *Developer*—a fully automated application generator
- *Dictionary*—a high speed utility to bring data from commercial database services into the information center database
- *Fastload*—an information center administrative tool for control of data access and documentation

Computer Corporation of America (CCA)

- ▻ *DSS Interfaces*—links the Intelligent Information Center with other commercially available decision support systems

Prod/Net—integrates personal computers, local area networks, peripherals, word processors, and host computers into a single communications system using existing hardware and technologies. Prod/Net connects personal computers into local networks, allows users to share expensive peripherals, and provides data transfer (including electronic mail) between mainframes and PC networks. Prod/Net also offers word processing translation, multitasking on networked PCs, and SNA host communications software for direct access to corporate data.

NETWORKING SERVICES

Access to CCA's service is available through long-distance direct dialing and via Tymnet and Telenet.

ON-LINE DATABASES

CCA supports no public on-line databases, although its clients' databases are on-line and available for client processing.

OTHER PROFESSIONAL SERVICES

CCA also provides services for the design and implementation of large-scale customized software systems in the areas of data management, communication, distributed processing, and office automation.

FUTURE PLANS

CCA's research and development staff performs innovative software technology development for government and industry. As new market needs develop, research and development resources will be applied to support new innovative services.□

Computer Network Corporation (COMNET)

Since its establishment in 1967, Computer Network Corporation (COMNET) has provided interactive and batch remote computing services through a nationwide communications network. COMNET offers major applications, covering data management and database management, education, engineering and scientific, government, and mathematics/statistics. COMNET also offers COM-MAIL, a software system for high-volume direct mail applications that is offered as a processing service. The company also provides software services for the health care industry through its COM-MED Division. Additional services include facilities management, proprietary software sales, contract programming, consulting, and nonimpact laser printing.

COMPANY INFORMATION

Computer Network Corporation
5185 MacArthur Boulevard, NW
Washington, DC 20016
Telephone (202) 537-2500

Company Background

Computer Network Corporation (COMNET), headquartered in Washington, DC, has provided traditional Remote Computing Services (RCS) since its corporate founding in 1967. COMNET's IBM and IBM-compatible facilities support remote job entry (RJE), on-site batch submission, and high/medium-speed (for RJE processing), as well as low/medium/high-speed (for interactive processing) communications lines. Application expertise includes data management and database management, education, engineering and scientific, government, and mathematics/statistics. Additional services include facilities management, consulting, and proprietary software marketing.

Competitive Position

COMNET lost a couple of major contracts in 1984 that resulted in two separate layoffs. COMNET employed approximately 150 people in 1983, and has reduced its employees to 104 in 1984. Despite the major cutbacks, sales revenues for fiscal year 1984 topped 1983's figure of $14,483,000.

Within the data processing industry, some of COMNET's competitors include Boeing Computer Services Company (BCS), Litton Mellonics Information Center, Automatic Data Processing, Inc., Electronic Data Systems (EDS), and American Management Systems, Inc. (AMS).

RESOURCES AND FACILITIES

Processing Center

COMNET's data center is located in Washington, DC. The central processing complex contains NAS/5 and NAS/6 plug-compatible mainframes in addition to an IBM 3033 and an IBM 370/158. The central processor units (CPUs) are linked together for data transfer via features on the peripheral control units that allow access to all tape and disk drives from all CPUs. The CPUs are further configured so that all I/O peripherals and associated control units, including the communication processors, are manually switchable in the event of a critical hardware outage. All user files, programs, libraries, and application programs are accessible from any system; no manual intervention is required for a user to alternate between processors.

Channels are smaller-scale, subservient computers that assist the CPUs by transmitting data between main memory and the input/output devices. The COMNET systems contain "block multiplexor" channels that process the input and output activities of disks, fixed-head disks and tapes, along with "byte multiplexors" that are used with the unit record devices, operator consoles, and the telecommunications processors.

All input/output devices can be accessed through one of two channels and two control units by the CPU. Such "dual channel" access minimizes delay and repetition of operations caused by a busy channel. Also, this "dual channel/control unit" access allows the user and systems to function if a channel or control unit becomes inoperative.

In addition to a battery of on-site, high-speed, impact printers, the COMNET data center has an off-line microfilm/microfiche capability and a Xerox 9700 nonimpact laser printer for high-quality printing at speeds up to 7200 pages per minute. Paper used with this device is 8½-by-11 inches, with a page capacity of 66 lines of 132 characters each. Multiple copy selection, two-sided printing, and copy collation are available.

The COMNET operating system will support up to 254 remote job entry (RJE) workstations, that usually consist of a card reader, a line printer, an operator console, and the necessary telecommunications hardware to link up with a remote computer. The remote job entry system supports a variety of workstations, including IBM 2770, IBM 2780, IBM 3780, IBM 1130, and IBM 360 Model 20. Workstations with multiple card readers, line printers, and card punches are also supported. Microcomputers that are capable of emulating above protocols can also be used as RJE workstations.

The COMNET system may be accessed from remote terminals by using the Alpha, TSO, or Wylbur-Plus time-sharing systems. From such terminals, a user may create and edit data sets, write and test programs, submit interactive and batch jobs, and print data files or the output from jobs. ▻

Computer Network Corporation (COMNET)

The COMNET computer system has been provided with a power supply system that regulates and filters commercial power and provides for continuous operations during short-term power failures. The power supply system consists of a battery plant, a motor generator, and two uninterruptible power supply (UPS) units.

Systems Software

OPERATING SYSTEMS: COMNET systems, currently operating under IBM MVT and MVS/SP Release 1.3, have been enhanced to provide added functions to the user. These enhancements include a tape management system supplied by UCCEL, a disk management system supplied by Cambridge System Group, and three COMNET proprietary software systems for security, billing, and job stream management. The operating system consists of five major components.

- *OS/VS2 MVS*, an IBM Corporation software product, supports such common features as a supervisor, job management facilities, the various access methods, and multiprocessing with shared real storage.

- *COMNET's Wylbur-Plus (Wylbur+)* is an enhanced version of NIH Extended Wylbur. Wylbur+ is a computer program that functions as an on-line interactive text editor. Terminals connected by telephone lines to COMNET's computer complex allow the user to communicate with Wylbur+. The user uses a collection of predefined instructions or commands to employ the facilities available in Wylbur+. The editing features of Wylbur+ provide an easy-to-use mechanism for creating, changing, searching, and displaying all kinds of text, such as computer programs and data, letters, proposals, reports, manuals, and lists. Wylbur+ batch processing facilities allow the user to submit a computer program to the batch job stream and examine the output at the terminal. The Wylbur+ command procedure facility provides commands to evaluate expressions, execute collections of stored commands, and perform comparisons and branching.

- *Alpha Time Sharing System*, a COMNET proprietary product, is an interactive time-sharing system that includes file editing capabilities, a remote job entry capability, and interactive processing of OS/VS2 MVS jobs. Each of these functions is available to the terminal user through an integrated command language. Capabilities include English-like commands and syntax; file create, edit, search, and save; user job monitoring; detailed Alpha command or error messages; intrasystem message transmission; user-tailored Alpha procedures; and automatic system backup.

- *Time Sharing Option (TSO)* is an IBM software package that permits interactive time-sharing operations to be run concurrently with teleprocessing and batch processing. Up to 14 regions can be devoted to time-sharing. Programmers at remote terminals can develop, execute, store, and modify programs written in an OS-supported language. Cobol, Fortran, and Assembler prompters permit the associated compilers to be used in a conversational mode, in dynamic debugging, and in program testing. TSO uses the Virtual Telecommunications Access Method (VTAM) to handle all remote terminal I/O operations. COMNET also offers the Interactive System Productivity Facility (ISPF) and ISPF Program Development Facility (PDF) to develop interactive applications using full-screen capability. Together, the ISPF and the PDF are designed to increase user productivity in the development of applications by taking advantage of the features of full-screen display terminals.

- *Job Entry System 2 (JES2)* is a COMNET-enhanced version of IBM's JES2. This remote job entry software provides users with the convenience of computer access through a remote batch card reader/line printer/tape unit terminal located at the user's site. It does not offer the versatility of the time-sharing system, but it does provide the capacity for high-volume applications.

UTILITIES: In addition to many of the batch utility functions provided by IBM, COMNET also offers other utilities and packages for user convenience. IBM utilities offered by COMNET facilities include the following:

- IEBCOPY copies partitioned or sequential data sets.
- IEBDG generates test data.
- IEBGENER copies sequential data sets with edit functions.
- IEBISAM copies ISAM data sets.
- IEBPTPCH, a print/punch utility program.
- IEBUPDTE, an update utility.
- IEHDASDR analyzes, unloads, and initializes disk packs.
- IEHLIST lists, catalogs, and packs PDS contents.
- IEHMOVE will move and copy partitioned or sequential data sets.
- IEHPROGM will scratch, rename, and catalog data sets.
- IDCAMS invokes the Access Method Services processor for VSAM files.
- SORT/MERGE handles sorting and merging functions.
- Linkage Editor and Loader are utility programs for converting modules produced by the compilers into load modules suitable for execution.

COMNET-provided utilities and packages include the following:

- *ASM2*, a disk management system developed by The Cambridge System Group, allows periodic data set archiving, retrieval, migration, and facilitates DASD usage reporting in batch and on-line environments. User friendly Wylbur-Plus macros and TSO CLISTS have been established to help users manage their disk volumes and data files.
- *Capex Optimizer III* provides automatic optimization of Cobol programs at compile time, reducing CPU and memory requirements.
- *Comflow* provides automatic flow charts for Fortran programs.
- *Compress* is used to compress a load library.
- *Condense* compresses a source library.

- *Disclose* surveys DASD volumes, catalogs, and prints reports.
- *Fastmap* will map a disk pack's contents.
- *FATAR* provides tape error detection and recovery.
- *FDR* provides disk pack dump/restore.
- *LISTPDS* produces a printer list of partitioned members.
- *Script*, a document-composition utility program from the University of Waterloo, accepts input, processes it, and produces output. The inputs to SCRIPT are text and control words that the user enters at an upper/lower case terminal. The output produced by SCRIPT is a file in which the input text has been composed into fully-made-up pages according to the layout instructions specified by the control words.
- *SYNCSORT* handles sorting and merging functions.
- *UCC ONE* Tape Management System (TMS), a product of UCCEL, is an automated tape management system that protects data stored on magnetic tapes and automates functions associated with controlling and managing the tape library in OS/VS environment. COMNET's TMS is an expanded version of UCC ONE that offers TMS security and volume management features to foreign, client-owned tape volumes.
- *Ziplabel* produces a printer list of tape labels.

DATA AND DATABASE MANAGEMENT: COMNET provides a comprehensive set of data management and database management software packages.

- *Customer Information Control System (CICS)* is an IBM general-purpose data communications monitor used by COMNET to control multiple on-line user terminals and applications. By consolidating the required communications interfaces, I/O, and control functions, CICS isolates the users' applications programs from the communications environment and, to a considerable degree, from the operating system itself. CICS provides transaction processing support for database management with file control programs written in Assembler, PL/1, or Cobol, thus allowing on-line applications to be developed without significantly greater difficulty than similar batch programs.

- *Easytrieve* is an information retrieval, file management and reporting system from Pansophic Systems, Inc. It can be used to produce reports from any number of input files, to a variety of output media. Output can also be used to create new, or update existing, master files.

- *Inquire* is marketed by Infodata Systems, Inc. It is an integrated database management system that allows users in batch or teleprocessing environments to create new databases without writing programs. Databases can be created independently and logically related when queries are executed.

- *Model 204* is a Computer Corporation of America database management system. The system features rapid multikey access, a high degree of data independence, and ease of use. It uses a proprietary implementation of the inverted file access method. The system can be used in batch mode, on-line with its own teleprocessing monitor, or through interfaces to CICS or TSO.

- *System 2000*, an Intel Corporation package, is a general-purpose database management system that allows a user to define, load, retrieve, and update databases. The system uses its own elementary command language and supports Boolean logic for selection criteria. Functions and command strings can be defined by the user and stored for later use. Addressing and I/O operations are handled automatically for the user. The system also includes a report writer, optional audit trail facility for updates, and an interface that permits Cobol, PL/1, or Fortran programs to be used with the database.

- *Terminal Application Processing System (TAPS)*, a product of Informatics General, is an on-line, interactive, transaction-oriented application system generator that provides master terminal control, application management routines, screen format building, data management routines, and automatic documentation.

PROGRAMMING LANGUAGES: COMNET maintains many different programming language compilers, interpreters, and assemblers. Selection of one language over another for a particular job is usually dictated by the type of task being programmed. For example, a scientific or mathematical task would normally be coded in the Fortran or PL/1 language, whereas Cobol or PL/1 would normally be chosen for commercial systems. The programming languages supported by COMNET include:

- *Assembler*, the lowest-level IBM 370 language.
- *Cobol*, a high-level language generally used for programming of business and commercial applications.
- *Fortran*, a high-level language mainly used for scientific and mathematical applications.
- *PL/1*, contains in a single high-level language, many of the attributes of Assembler Language, Cobol, and Fortran.
- *Basic*, an easy to learn and use, interpretive high-level language.
- *APL*, a versatile general-purpose programming language, providing a direct means for problem solving in such diverse applications as commercial data processing, system design, mathematical and scientific computation, and the teaching of mathematics and other subjects.

Customer Support Services

COMNET provides customer support services through two specialized groups. Staffed by 15 professionals, the groups are designated as Helpline and Support Services.

Helpline provides a highly responsive focal point for service-related customer assistance. A primary objective of this group is to maximize customer convenience in the use of COMNET's products and services. To that end, Helpline serves as a coordinator between customers and other departments within COMNET to resolve problems and answer questions related to the usage of the COMNET

Computer Network Corporation (COMNET)

computer and software facilities. Helpline is available from 7:30 a.m. through 6:00 p.m., Monday through Friday, to provide assistance via low-speed terminal, telephone, walk-in visitation, or by mail. The activities and services supported by Helpline include the following:

- COMNET facility usage
- JCL usage assistance
- Job-status inquiries
- USERID validations and modifications
- Source and Load Library allocations
- Alpha, Wylbur, and TSO command language usage
- Remote terminal validation
- Systems availability/responsiveness monitoring and problem reporting
- Data set recovery assistance/coordination
- Disk/tape copy coordination
- Tape surface analysis coordination
- Disk space usage monitoring/analysis/compression
- Broadcast message dispatching
- Establishing funding limits

COMNET's Support Services provides more extensive technical and advisory assistance than is provided by Helpline. The primary responsibility of all COMNET Support Services personnel is to assist clients in the use of COMNET's various services so that they realize the maximum return on their investment in time-sharing services, meet their system development schedules, meet their production processing schedules, and fulfill their business--oriented requirements through the use of computers.

COMNET Support Services personnel are skilled in the use of the Alpha, Wylbur, TSO, and RJE Services, in addition to being experienced data processing professionals. The activities and services provided by Support Services include:

- Systems design
- Contract programming
- Data conversion
- Data resource security
- Database management and DBMS support
- Systems assistance
- Statistical analysis
- Consulting services
- Training
- Documentation

Sales and Marketing Services

All sales and marketing services are primarily geared to end users, and are headquartered in Washington, DC. In addition to marketing time-sharing and remote batch computing services, COMNET also markets services in such areas as facilities management, consulting, programming, graphics, and nonimpact laser printing.

COMNET has a TSP/MASC contract with the General Services Administration. As a result of this contract, COMNET is a Multiple Award Schedule Contractor for fiscal year 1984, and is among the lowest priced, full-service, IBM-equipped vendors on the schedule.

As part of the conversion effort of one contract, COMNET personnel set up all operational procedures, converted all data, set up a 12,000 reel tape library, and instituted procedures and subcontracts for copying, micrographics, keypunching and coding.

COMNET personnel staff the production center and are responsible for running all production systems. Functions include Remote Terminal Operations (RTO), production control specialists, and system engineering. The RTO's enter all production jobs through high-speed remote terminals, retrieve and disperse all production runs, modify job control statements, check control balances, update production run books, enter control totals, schedule Xerox and micrographics activities, and suggest enhancements to streamline production processing. The system engineers aid users in the use of the COMNET system, train users in COMNET procedures and products, analyze systems, and implement improvement to both production and development processes. They are also responsible for analyzing production systems before they are accepted into the production environment.

COMNET was also awarded a contract to provide an automated information system to be used throughout the United States. Requirements included the improvement of quality and timeliness of information for management decision-making and control, the provisions of tools to aid legal staff in working effectively, the means to improve clerical staff productivity, the improvement of communications with regional offices, the improvement of data security, and the reduction of overall operating costs. To satisfy these requirements, COMNET provides computer hardware resources, software, telecommunications, and professional personnel support.

APPLICATION-SPECIFIC SERVICES

COMNET's IBM and IBM-compatible mainframe facilities, operating under MVS, with application software packages and a nationwide communications network, support interactive processing, remote job entry, and on-site (Washington, DC) batch submission. Computing service capabilities cover a wide range of general applications, including data management and database management, education, engineering and scientific, government, and mathematics/statistics.

Banking and Finance

COMNET offers an IBM software product called *Plancode* for financial planning models. Plancode provides facilities for the building and implementation of business planning models by means of a plan simulation language. Programs are included that provide for consolidating plans and for performing "What if" sensitivity analyses. Other features include a double-entry data table for calculation purposes, an English-like modeling language, a planning data set that

Computer Network Corporation (COMNET)

allows users to store planning data, and a model execution feature. Standard tabular report formats and charts are provided, and user-specified report layouts can be designed.

Management Sciences

COMNET offers two management science software systems.

- *General Purpose Simulation System IV (GPSS),* an IBM program for conducting evaluations of and experiments with systems, methods, processes, and designs. A GPSS program is built around a set of simple entities that are divided into four classes: dynamic, equipment, statistical, and operational. Dynamic entities are called transactions and represent units of traffic. Equipment entities represent objects that are acted upon by transactions. Statistical entities are queues and tables that measure system behavior. The operational entities provide the logic of a system, instructing the transactions where to go and what to do.

- *Project Management System IV (PMSIV),* an IBM management tool designed to aid in the planning and control of resources. The system provides critical path and general cost analyses, PERT and PERT COST capabilities, precedence and precedence/cost capabilities, as well as resource allocation. A flexible add-on and substitution capability allows for a growing library of management-oriented routines and permits the user to tailor the program to the specific requirements of his installation.

Mathematics and Statistics

For mathematical and statistical operations, the COMNET library includes a wide variety of software packages.

- *Biomedical Computer Programs (BMCP),* distributed by BMDP Statistical Software, Inc., is a series of statistical programs, originally intended for use by researchers in the health sciences. The system can also be used for problems in the physical sciences, but is not intended to solve the highly ill-conditioned problems sometimes encountered in those disciplines.

- *Data-text,* a software package from Pro Systems, is designed for large, complex analyses. Certain key routines have been fine-tuned for efficient processing of large data sets. All statistical routines access a common pool of variables and labels in central memory, enabling Data-Text to process data transformations and multiple statistical requests with a single pass of the data. Also included with the basic system are freestanding utilities for sorting a standardized file and for converting to and from SPSS standardized format.

- *Econometric Software Package (ESP),* is designed to carry out all the computational and data processing steps routinely required in econometric research. The package provides for the statistical analysis of time series data with regression analysis capabilities, including ordinary least squares, three-stage least squares, restricted and group estimation, and Box-Jenkins analysis. ESP also provides some cross-sectional procedures frequently used in analyzing demand and price behavior. ESP is a product of Synergy, Inc.

- *Matrix Language (MATLAN)* is an IBM software product. It facilitates the solution of problems requiring substantial amounts of matrix manipulation by providing a syntax that expresses matrix operations succinctly and unencumbered by the loop control statements necessary in most programming languages.

- *Mathematical Programming System—Extended (MPSX)* is an IBM mathematical software system that solves linear programming, linear separable programming, and mixed integer programming problems. It is adept at the solution of large models that exceed main storage availability under most other mathematical programming systems and offers user control of solution techniques and tolerances.

- *Scientific Subroutine Package (SSP),* an IBM product, is a collection of 121 Fortran subroutines that augment those built into Fortran. The package includes integration of differential equations; Fourier analysis; Bessel and modified Bessel function evaluation; gamma functional evaluation; polynomial evaluation; and elliptic, exponential, sine, cosine, and Fresnel integrals.

- *Statistical Analysis System (SAS),* from SAS Institute, Inc., is an integrated system for statistical analysis and data management. It combines statistics routines, plotting, data manipulation, and report writing capabilities. SAS has a PL/1-like language that is used to transform or delete variables, create new variables, create new data sets, and print all or part of a data set. It accepts data in most forms and can handle many input devices. The system also performs general data manipulation and many statistical functions. COMNET also offers the *SAS/FSP (Full Screen Product),* that provides interactive, menu-driven facilities for data entry, editing, and retrieval.

- *Table Producing Language (TPL),* furnished by the Bureau of Labor Statistics of the U.S. Department of Labor, has been designed and implemented as a general tool for producing statistical tables. It can be used by statistical agencies such as the Bureau of Labor Statistics to produce the results of its surveys in tabular form. The tables are often complex, with common requirements for cross tabulation of irregular patterns of hierarchical data files with many intermediate levels of summarization, percentage distributions, measures of statistical precision, and intricate publication formats.

- *Time Series Processor (TSP)* is a software product from Bronwyn H. Hall, Inc. TSP is a computer language for the statistical analysis of time series by ordinary least squares and two-stage least squares. It is designed to carry out all the computation steps in developing and using econometric models with time series data.

Computer Network Corporation (COMNET)

- *Statistically Oriented Users Package (SOUPAC)* was developed at the University of Illinois. SOUPAC allows the user to perform a number of statistical analyses on all or a subset of one or more databases, without reformatting the input data, and without the need to invoke separate programs or make separate computer runs for each analysis. The capabilities of the program are dependent on the particular analysis being performed. Generally speaking, SOUPAC was developed in a university teaching, research, and consulting environment and utilizes proven and acceptable methods for each type of analysis.

- *Statistical Package for the Social Sciences (SPSS)* is a software product from SPSS, Inc. SPSS is an integrated system of computer programs for the analysis of social science data. It has facilities: to generate new variables that are mathematical and/or logical combinations of existing variables; to recode variables; and to sample, select, or weigh specified cases.

Graphics

Several graphics packages provide COMNET users with the ability to plot and produce graphs for visual presentations.

- *SAS/GRAPH,* a product of SAS Institute, Inc., is a device-intelligent computer graphics system for producing color plots, bar charts, graphs, and slides on screens and plotters. It also includes capabilities for producing three-dimensional displays, contour plots, and maps. The system allows the design of displays in the form of pictures. Title and footnote capabilities allow the user to explain the nature of the data and to annotate the display.

- *DISSPLA*, a product of ISSCO Graphics, is a plotting language that can generate management charts, scientific and engineering graphs, reports, maps, contours, and 3D designs with clarity and color. DISSPLA can turn applications program into chart generators. Line graphs, bar charts, pie charts, text pages, and surface plots are all easy to produce and may also be combined and positioned on the same page. DISSPLA outputs to any graphics CRT or plotting device on a variety of media, including paper, overhead transparencies, and 35mm slides.

- The *PLOT 10 Interactive Graphics Library,* produced by Tektronix, Inc., consists of modular, upward- and downward-compatible routines that can be used to develop interactive graphics applications programs in business and scientific environments. Capabilities include two- and three-dimensional graphics, color control, line smoothing, and manipulation of character fonts.

- *TELL-A-GRAF,* a product of ISSCO Graphics, is a color graphics package capable of generating a variety of graph types—line, bar, and pie—as well as text pages. It uses the same data format for each type of graph. Several different graphs may be combined and positioned on the same page. Its command language is simple conversational English and may be used easily by nonprogrammers as well as experienced programmers. TELL-A-GRAF is device-independent and will work with any graphics hardware device.

Security System

COMNET's *Security System* provides each user an individually controlled security level for proprietary data. It is designed for all COMNET users, whatever their level of security requirements. The system prevent unauthorized access to the COMNET computer system and to all protected data. The COMNET Security System has the following features:

- It provides controlled levels of access privileges, so that users may specify, for any data, the most appropriate protection level.
- It permits the establishment of groups of users with shared privileges.
- It provides the option of unprotected data.
- It provides a lockout of unauthorized users.
- It can be administered to meet the requirements of any given organization.
- It permits shared protection authority, allowing both peers and supervisors to control access privileges.

Direct Mail

COMNET offers a software system for mail management, that was designed to maximize cost savings for major mailers by taking full advantage of Postal Service discounts. The *COM-MAIL* mail management system has highly sophisticated functional capabilities: carrier route coding, that is accomplished by the Carrier Route Sorting System (CR$$); and processing of direct mail lists, that utilizes CR$$ in conjunction with a series of direct mail software programs.

The *Carrier Route Sorting System (CR$$)* uses a USPS-supplied database, and applies carrier route codes to mailing lists. Its highly sophisticated matching process interprets addresses much like a human, and allows for errors in the input data, including misspellings, transposed letters, missing characters, and abbreviations. The qualifying process maximizes discounts considering all levels of postage discounts and mail handling (lettershop) costs.

CR$$ not only provides the necessary reports required by the USPS for audit trails, but also produces mailing analyses, and bag/tray tags, and offers many options for the direct mailer.

Besides CR$$, COM-MAIL incorporates six other software subsystems.

- The *List Conversion* system converts mailing lists from one format to another through simple parameters that allow the nonprogrammer/user to convert mailing lists quickly. The program separates and/or strings together the different elements of a name and address record.

- The *EZ-5 ZIP Code Correction* system is a complete ZIP Code verification and correction system designed to look at, not only the input ZIP Code, but the existing ZIP Code as well. This inhibits changes to existing ZIPs that are correct according to street address but differ from the city name.

- The *Duplicate Elimination* system will identify and eliminate duplicates on an inter/intrafile basis. The technique used in identifying duplicate names is not a common match code, but a highly sophisticated technique that analyzes the entire name and address. Records are identified as duplicates even if the individual's name and/or address has character transpositions, misspellings, or characters missing.

- The *Generalized Selection* system has four major functions: a variety of selection capabilities, ZIP Code demographic selection/application functions, match/merge capabilities, and report generation functions.

- The *EZ-9 ZIP+4 Coding* system is an accurate and efficient program for assigning 4-digit add-on codes, and thereby enables a mailer to take advantage of the latest automated processing techniques utilized by the U.S. Postal Service. In addition to the coding portion, this system has a complete optimization feature for maximum postage discounts, while allowing for the integration of non-ZIP+4 mail.

- *Label Print* is a parameter-driven program to print name and address mailing labels in a wide variety of output formats. In addition to name and address data, the program will print mailing key information and other data on the label.

Health Care

COMNET's current health care products and services, are offered by the *COM-MED Division* via the batch/service bureau mode only. COM-MED specializes in providing data processing/consulting services to long-term care facilities. The products and services provided are as follows:

- Billing and accounts receivable
- Accounts payable
- General ledger
- Patient fund accounting
- Physician billing
- Long-term home health
- Medical records consulting
- Survey and compliance consulting
- In-house paper flow analysis
- Fiscal reimbursement consulting
- Quality assurance programs
- Joint commission accreditation

The COM-MED Division plans to offer in the future, a comprehensive, integrated nursing home system that includes the financial applications that are currently being offered, coupled with a census and a patient care system. These software packages will be offered via three modes of operation: on-line version (personal computer and CRTs); batch version; and turnkey version, with leased/purchased software or the personal computer turnkey version with leased software. The new systems currently in development (available in June 1985) are the Census System and the Patient Care Information System.

NETWORKING SERVICES

COMNET has a nationwide telecommunications network that services the data center in Washington, DC. Any task performed using a terminal reaches the data center via this network.

The network contains three NCR COMTEN 3670 processors. One of the communications processors is capable of terminating four time-division multiplexors, 32 synchronous/bisynchronous circuits, and 150 asynchronous circuits. Each asynchronous port on the COMTEN processor is programmed to perform automatic baud-rate detection for all common speeds from 75 bits per second through 1800 bits per second. Dynamic port selection is used to select host applications, thereby separating IBM software subchannel dependence from physical line dependence. The second communication processor is capable of terminating a variety of BSC and SDLC lines under control of NCP. Lines may be switched or nonswitched, point-to-point, or multidropped. Host application software are selected using IBM's VTAM program product. This facilitates the attachment of all SNA devices, including 3270s, 3290s, and personal computers. COMNET also supports a variety of intelligent ASCII terminals and personal computers in full screen mode through protocol converters attached to NCP. The third communication processor is configured as a "hot backup" for either of the first two. The backup is available to provide immediate backup in the event of a failure on either of the two production 3670s. Circuits are supplied by the most cost-effective common carrier: in current use are C&P local service, AT&T long lines for private lines, a specialized common carrier for remote city access, and WATS for nationwide small-town service.

COMNET provides low-speed access service through two value-added networks (VANs), and specialized common carriers. The VANs provide cost economies by sharing among multiple users. The network is implemented by the use of multiple supervisors for point-to-point route establishment, and concentrators and multiplexors for cost-effective network entry. The trunk system features error correction for each packet, and most entry points have multiple, alternate trunk capabilities to maintain access in the rare case of a trunk failure.

The network is continually monitored at COMNET to ensure that the level of service provided at each customer location is consistent with the requirements. This monitoring has a primary goal in the prediction of usage patterns and the anticipation of service expansion. It also serves as a warning of pending error conditions that will produce

▷ outages. The warning is often sufficiently in advance of the actual outage to allow corrective action to be taken before the actual failure.

FUTURE PLANS

COMNET plans to continue marketing in areas where data management, database management, education, engineering/scientific, government and mathematical/statistical applications are of paramount interest. COMNET's future plans anticipate an expansion in proprietary software sales and in new application sensitive markets, as well as continued development of a line of microprocessor-based distributed processing computers in liaison with U.S. Design Corporation.

COMNET is currently expanding its time-sharing offering to include VM and CMS. VM will be available from most of COMNET's normal network, and will feature the ability to share data with MVS for use in developing software intended for multiple operating systems. Also, COMNET is expanding its facilities to not only connect and communicate with personal computers, but to provide resources and functions to augment the personal computer.

The COM-MED Division plans to offer a comprehensive, integrated nursing home system, that will include the financial applications that are currently being offered, coupled with a census and patient care system. These systems will be offered through three modes of operation: on-line, batch, and turnkey with leased or purchased software. □

Computer Resources Services, Inc. (CRS)

COMPANY INFORMATION

Computer Resources Services, Inc.
770 East Sahara Avenue
Las Vegas, NV 89104
Telephone (702) 369-2800

Company Background

Computer Resources Services (CRS), which offers remote computing services for small- to midsized companies in Arizona, Nevada, and Texas, was established in 1970. Data-Corp of Nevada, a privately held firm, acquired the company in November 1981. The additional working capital Data-Corp provided, enabled CRS to expand its services and open additional sales offices.

The company has a staff of 28 professionals, all of whom are dedicated to the on-line services business. Application packages include payroll, accounts receivable, accounts payable, general ledger, time and cost accounting, inventory management, and hotel and hospital management.

Competitive Position

The past year has been a slow one for Computer Resources Services, and according to President Ben Johnson, the company "just tried to hold its own." Johnson attributed the company's slow year to the general downturn in the time-sharing industry, due to more companies going in-house. This downturn has forced CRS to close many of the sales offices it was able to establish following the 1981 takeover of the company by Data-Corp.

For CRS to remain solvent it may have to direct its resources away from time-sharing, instead of trying to compete against such formidable, and well-entrenched competitors as Automatic Data Processing and Reynolds & Reynolds. CRS is already moving in this direction, and during 1985 the company hopes to expand more into vertical markets and to begin leasing hardware and software.

RESOURCES AND FACILITIES

Processing Centers

CRS maintains a data processing center in Phoenix, Arizona. This center houses a variety of equipment, and the on-line services are provided by a Hewlett-Packard processor and an Alpha Microsystem.

System Software

CRS does not allow users to access system software, which is proprietary.

Computer Resources Services (CRS) was established in 1970 to provide remote computing services to small- to medium-sized companies in the southwest. CRS provides proprietary software packages along with its on-line services. Application services include accounting, banking and finance, mathematics and statistics, payroll, and hotel and hospital management. The company also plans to begin leasing hardware and software. In 1981, CRS was acquired by Data-Corp of Nevada, a privately held company.

Customer Support Services

CRS provides documentation and training to its clients.

Sales and Marketing Services

All sales are handled out of local offices in Las Vegas, Phoenix, Fort Worth, Dallas, and Houston.

Pricing

CRS' pricing schedule is shown in Table 1.

APPLICATION-SPECIFIC SERVICES

Accounting

Accounts Payable—a generalized check writing and check reconciliation system that provides control of current obligations from initial entry of an invoice to bank statement reconciliation.

Accounts Receivable (A/R)—designed for businesses of all sizes and requires no computer knowledge. The system provides instant statements and accounts receivable information on easy-to-operate equipment located in the client's office and operated by present employees. A/R was designed by financial and credit managers for total accounts receivable processing. It is a cash management-oriented system designed to help improve collections and increase cash flow.

Order Entry—a complete, flexible system that offers the following features:

- Controlling back orders
- Controlling high-volume inventory
- Minimizing lost sales
- Minimizing lost inventory
- Automatic printing of shipping lists
- Monthly inventory evaluation reporting
- Daily order control
- Profit performance reports by cost/sales
- Simplified order entry
- Automatic A/R transferring
- Complete invoicing with extensions

Computer Resources Services, Inc. (CRS)

Computer Connect Time

	10 cps*	15/20/30 cps
Per hour	$10	$15
Dedicated port (unlimited connect time)	$900/month	$1,100/month

*cps = characters per second

Storage

Units**	Price***
1-300	$0 + $.60/unit
301-1,000	$180 + $.50/unit
1,001-and greater	$530 + $.30/unit

**One unit=1,024 characters

***Monthly average per unit

Bulk Agreement

One dedicated port (10/15/20/30 cps)
1,000 units storage (1 block)
$1,250/month—one-year agreement
Additional storage $100/block

A onetime fee of $100 is charged for initiating time-sharing service.

Monthly usage of less than $50 will be adjusted to this minimum charge.

Magnetic tape operations are $10 each.

Magnetic tape storage is $5 per month per reel.

Table 1. Computer Resources Services price schedule

▷ *Time and Cost Accounting (Taco)*—a system oriented to small businesses, designed to be easily used by small- to midsized manufacturers, job shops, and construction companies. Taco offers the following features:

Recording all time and material costs by:

- Customer or job
- Materials and expenses
- Activity or department

Establishing budgeted versus actual costs to date by:

- Customer or job
- Materials and expenses
- Activity or department

Summarizing time and material costs by:

- Phase summary reports
- Phase total reports
- Establishing proof of posting
- Obtaining data for payroll preparation
- Maintaining simplicity and speed of operation
- Reducing cost

General Ledger—a computerized system that enables professional accountants to prepare finished statements cheaply and without computer skill. From the original entry of transactions, G/L automatically prepares and prints:

- A general ledger
- Financial statements in standard or comparative format (current month and year-to-date)
- Profit and loss schedules
- Balance sheet schedules
- Sales and gross profit breakdowns
- Departmental statements
- Consolidated statements
- Calculations of depreciation, income tax, cost of goods sold, and allocation of expenses

Inventory Management—provides immediate access to inventory records. The system provides vital management information in the following areas:

- Inventory valuation
- Costing data
- Perpetual auditing
- Stock location
- Reordering data
- Usage analysis
- Price list and catalogs
- Lost sale analysis
- Profit performance reporting on sales and costs
- Scheduling

Fast W2—provides a way to prepare quarterly and annual 941-As and W-2s with minimal effort. The accounting firm enters the appropriate payroll information for its clients; these forms are then printed automatically in the client's office. Once the payroll information has been entered, no further clerical effort is required. Fast W2 is completely self-instructing and requires no computer knowledge.

Report—a CRS computer technique that leads its users through a question-and-answer program that asks for all the information it requires. The final statistics produced by Report are in the accounting format specified by the user. Report can also consolidate data from numerous previous tabulations and provide a new report with minimum effort.

Banking and Finance

Investment Management—CRS offers *Evalu8,* an investment appraisal package that provides:

- Cash flow sensitivity analyses
- Immediate calculations of DCF rate of return, net present value, and payback period
- Rapid comparison of alternatives
- Easily built models of cash flow interrelationship
- Adjustment of parameters such as depreciation and tax allowances

Mathematics and Statistics

Regpak—a statistical package specializing in multiple regression using regression analysis to measure the effect of various factors on output. It has been developed by CRS specifically to meet the requirements of statisticians and operational research scientists. All forms of regression anal- ▷

➤ ysis can be carried out on a single database. Regpak gives the user complete control throughout the analysis, allowing regression equations to be built in a conversational manner.

Payroll

The CRS flexible payroll service offers a variety of features, including the ability to prepare detailed employee earnings statements. Preprinted forms are used for checks and cash payrolls. Input may be direct from employee time sheets. The system allows flexibility in calculating total pay and deductions in terms of overtime rates, other pay, and special pay, along with other considerations. Pay deductions, registers, and disbursements of costs may be automatically analyzed. The system has a selective pay-off feature and a quarterly write-off option. Employees may be hourly or salaried and paid weekly, biweekly, semimonthly, or monthly. Quarterly tax information is provided in addition to 941-As and W-2s. Union hourly reporting can be provided. Authorized deductions can be easily added or deleted without changing forms.

NETWORKING SERVICES

CRS's on-line services are available via dial-up services and private lines.

ON-LINE DATABASES

CRS supports no public on-line databases, although its clients' individual databases are on-line and available for client processing.

FUTURE PLANS

During 1985, CRS plans to expand more into vertical markets and begin leasing hardware and software. ☐

Computer Sciences Corporation (CSC)

COMPANY INFORMATION

Computer Sciences Corporation
2100 East Grand Avenue
El Segundo, CA 90245
Telephone (213) 615-0311

Founded in 1959, Computer Sciences Corporation (CSC) is one of the nation's largest computer services organizations. CSC provides its services through three operating groups.

The Industry Services Group (El Segundo, CA) serves specific market niches with information processing services in consumer credit reporting, insurance claims processing, and income tax return processing. It also markets turnkey systems to health maintenance organizations. The group's primary markets include banks and other credit grantors, income tax preparers, government agencies, and medical plans.

The Systems Group (Falls Church, VA) develops custom-designed computer and communications systems, performs large-scale system integration, and provides operational support of clients' technical activities and computer facilities management. It also develops complete systems to client specifications, supplying and integrating all of the hardware, software, communications, training, and related components required to deliver an operational system. The Systems Group's primary markets are U.S. and foreign governments.

The Information Network Services Group (El Segundo, CA) provides value-added communications, distributed processing, and remote computing services. These services utilize personal computers, minicomputers, and large central database computers to process and transmit information via CSC's worldwide data communications network, Infonet. The group also provides applications services for telephone utilities, distributors, and manufacturers; and performs facilities management, system development, contract programming, and other professional services, and system integration services. Its primary markets are Fortune 500 and multinational corporations, telephone companies, distributors and manufacturers, state and local governments, and the U.S. government.

Company Background

Computer Sciences Corporation (CSC) is one of the nation's largest computer services organizations, ranking 87th on *Fortune* magazine's 1986 ranking of the 100 largest diversified service companies. Founded in 1959, CSC was one of the first companies organized to provide computer software and related consulting services. CSC has since expanded its technical capabilities to include the design, engineering, and integration of computer-based systems and communications systems. Its services include requirements analysis, computer software development, systems engineering and integration, communications systems engineering, computer facilities management, and key information skills placement for client requirements such as contract programming and design. CSC also delivers complete turnkey information systems, including all of the hardware, software, training, operational staff, physical facilities, and associated elements required to place the system in operation.

In fiscal 1970, CSC entered the processing services market with Infonet, a proprietary international remote computing network service. In 1984, CSC shifted the thrust of its Infonet development and marketing efforts from timesharing to communications-based services ranging from electronic mail services to worldwide data collection, consolidation, and reporting services using microcomputers, minicomputers, and mainframe computers. In addition, CSC has greatly expanded its IBM services providing data communications, computational, and central database services via the network.

CSC also initiated a program for diversifying and expanding its commercial services, and now provides:

- Professional services, including software development and system integration; consulting and advisory services; computer facilities startup, operation, and management; and key skills placement for contract programming and design services to both commercial clients and state and local governments.
- Credit reporting services to retail firms, banks, and credit bureaus in 26 states. CSC's subsidiary, Associated Credit Services, is the fifth largest consumer credit reporting service in the U.S.
- Inventory management, billing, and accounting services to distributors nationwide on a remote-access basis from a data center in Pittsburgh.
- Turnkey systems for manufacturers and health care organizations through its subsidiaries Compufact and COM-TEC, Inc., respectively.
- Income tax preparation services nationwide from data centers in Los Angeles and Chicago.

CSC employs approximately 16,000 people who represent a wide range of technical disciplines and expertise. They

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Computer Sciences Corporation (CSC)

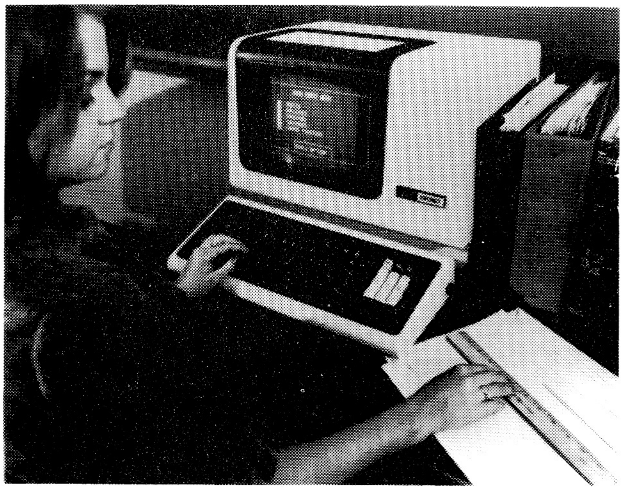

Figure 1. Clerical personnel can enter data and generate reports on video input terminals supplied with the Infonet Distributed Network Service, using a menu of functions called up on the screen. High-level languages, data handling utilities, and Infonet's Manage database management system also allow programmers to develop new applications quickly on the terminal.

include mathematicians and physicists, astronomers, medical doctors, and PhDs in the physical and social sciences, systems analysts, and engineers in fields ranging from communications to thermodynamics.

CSC's corporate offices are in the Los Angeles suburb of El Segundo, CA. Employees are based at some 250 CSC facilities and customer sites throughout the U.S. and foreign countries. The largest concentration of employees (5,000) is in metropolitan Washington, DC, which includes the Falls Church, VA headquarters of CSC's Systems Group.

Computer Sciences Corporation is a publicly owned company whose stock is traded on the New York Stock Exchange. CSC's fiscal 1986 revenue was $838,587,000.

RESOURCES AND FACILITIES

CSC uses a variety of manufacturers' equipment to provide their various services.

System Software

While CSC utilizes manufacturer system software, such as the standard IBM software (MVS, JES, TSO, etc.), the heart of their communications network, Infonet, is proprietary software developed by CSC over the last decade.

UTILITIES: CSC utilities are wide-ranging and include the following:
- Cobol and Fortran source conversion
- Code conversion
- File copy and transfer
- Sort/merge aids
- Report formatting aids
- Security aids
- Compare aids
- Storage and retrieval aids
- Electronic mail
- Micro-mainframe link
- Word processing conversion
- Electronic messaging
- On-line/off-line processing
- ASCII/EBCDIC conversion

LANGUAGES: CSC provides a full range of languages, including Cobol, Fortran, Basic, and APL and PL/1, as well as the associated debugging aids.

DATA AND DATABASE MANAGEMENT: CSC's proprietary database management system, *Manage*, provides for database definition, creation, and maintenance, with a wide range of access methods. Included are inquiry and report writing facilities, procedural language, host language interfaces, and utilities. Other DBMSs supported include FOCUS, IDMS/R, and System 2000.

Customer Support Services

CSC reports that it has a large professional staff, knowledgeable in all areas of the information processing industry. Its customer support services range from answering "hot line" questions (directed to the 24-hour/7-day Infonet Support Center) to full design of systems.

Professional services aid commercial clients in taking the best advantage of Infonet's centralized host computers, worldwide value-added network services, and software products. The services include feasibility surveys and requirements analysis to determine the best hardware, software, and telecommunications "fit" for its clients. If Infonet resources are a proper "fit," professional services provide custom software development, or implement the appropriate packaged software.

Sales and Marketing Services

CSC's Infonet value-added network services are available in 67 countries through IRC access, and 19 countries through local "in-country" access from CSC communications nodes. Also, local access is available in an additional 10 countries through "in-country" networks, as follows:
- Australia (AUSTPAC)
- Belgium (DCS)
- Canada (DATAPAC)
- France (TRANSPAC)
- Japan (Venus)
- Korea (DACOM)
- Germany (DATEX-P)
- Spain (IBERPAC)
- Scandanavia (Televerket)
- United Kingdom (PSS)

APPLICATION-SPECIFIC SERVICES

Infonet, CSC's proprietary international remote computing network service, was established in 1971. The service has

Computer Sciences Corporation (CSC)

▷ evolved over years of field use, and provides both interactive and batch services. In fiscal 1984, CSC converted Infonet to a value-added network services offering. Infonet provides the following major categories of application programs and programming tools:

- Value-added network services
- Data management
- Financial management
- Economic forecasting
- Management sciences
- Graphics
- Communications industries
- Electronic mail

Each category represents a complete and up-to-date capability fully supported by application specialists. Many programs can interact with one another to form total systems using the capabilities of numerous disciplines. For example, information maintained by a data management system can be passed to a financial system for incorporation into a business model for analysis. Results can then be displayed graphically. By making total system implementation easier, program interaction significantly reduces the time and cost previously required to produce such systems.

Programs can be run in the interactive mode for immediate response, or in the deferred batch processing mode for delayed response. With this capability, Infonet users respond to immediate needs for information, when necessary, and take advantage of lower cost-deferred processing when reporting requirements are known and can be scheduled in advance. All applications can be run from a microprocessor, if desired.

A brief description of available options under each of the categories follows.

Financial Management

Flares II—a financial analysis and reporting system that is an English-like language used for developing models. It contains a library of financial and simulation functions.

IFPS (CSVS)—a decision support system for cross-industry problem solving. It facilitates building models and solving them with varying assumptions. It also includes a report generator and graphics capabilities. Processing occurs through microcomputers or Infonet's mainframe, with communications provided by the network.

Economic Forecasting

AutoBJ—a system that forecasts and analyzes time series data using Box-Jenkins procedures.

Distat—an interactive forecasting system that provides for analysis of time series data.

SAS/ETS—provides the SAS user with several procedures for planning, forecasting, and financial reporting. It includes procedures for econometric modeling, time series analysis, and linear and nonlinear systems simulation. The procedures are often used with *SAS/GRAPH* for results presentation.

Electronic Mail

Notice—includes a complete range of electronic mail features, forms processing, computer processes, information file transfer, and a microcomputer software package for distributed electronic mail.

Notice/Telex—CSC's proprietary telex refiling system.

Mathematics and Statistics

SPSS—the complete implementation of the industry-standard statistical system that provides the social scientist with a unified and comprehensive package of analytical programs.

SAS—a broad-based system for presenting, editing, transforming, generating, and analyzing statistical data. The system provides for all of the popular statistical analyses including univariate and multivariate analyses of variance.

CSTS Stat Pack—a collection of statistical and mathematical subroutines.

Management Sciences

Mister—a large and fully tested program for critical path scheduling, resource scheduling, and job cost analysis.

Spred—a program for management control of projects using critical path scheduling techniques.

SAS/OR—provides the SAS user with procedures for critical path analysis and linear programming. A project optimization tool, it provides data to strengthen and support decision making.

GPSS—a general-purpose, discrete simulation tool for simulating and examining the behavior of systems in engineering and management sciences.

Graphics

IGL—a conversational graphics system that can accept data from a wide variety of sources and plot it. Input can come from any combination of Manage or regular files, terminal input, and Flares II or Distat plot files.

Disspla (CSVS & CSTS)—an integrated facility that generates virtually any graphic representation of data or text. Disspla offers capabilities that include self-scaling, multiple character sets, axes types, and three-dimensional plotting.

Encore—a graphics system that displays time-series and paired data created by programs.

Sketch—a utility that directs graphic output from any of the Infonet application programs to a variety of plotting devices. ▷

Tell-A-Graf (CSVS)—a conversational computer graphics system that produces publication-quality charts and graphs, regardless of plotting device. Tell-A-Graf understands English-like commands, and creates both simple and complex graphs.

SAS/Graph (CSVS)—a component of the SAS system that gives the user a wide range of capabilities for producing color presentation graphics.

MICROCOMPUTER SOFTWARE/ SERVICES

CSC has expanded the integration of microcomputer capabilities into the data network to provide customers with the combined benefits of user-friendly intersite communications, local processing, local database availability on the microcomputer, and integration with office automation products. Infonet currently interfaces directly with the IBM Personal Computer, the Apple series, Texas Instruments, and other software-compatible configurations.

NETWORKING SERVICES

Infonet Network Services is CSC's proprietary value-added network service. Infonet supports the international remote computer services of CSC, such as CSTSII and CSVS. Service is now available to connect the user's terminal, personal computers, and word processors directly to the user's own hosts. Infonet supports a wide range of terminals and protocols, including asynchronous, 2780/3780, 3270 BSC, and X.25 access worldwide. The network offers transmission speeds from 50 to 14,400 bps, with higher speeds available upon request. Infonet has over 175 communications computers and 130,000 miles of dedicated lines. Average end-to-end availability exceeds 99.7 percent; with interface redundancy, availability greater than 99.9 percent is common. Mean one-way delay time at interactive terminals is less than 300 milliseconds in the continental U.S., and less than 600 milliseconds internationally. Redundant network control centers (NCCs) are used to load, dump, monitor, and test the network.

Special features of the network include its ability to reroute virtual circuits around intermediate link failures transparently to the user, a priority scheme that optimizes response time to interactive users, while maintaining throughput on file transfers, and the international support provided.

CSVS

The IBM 3084-based CSVS system is accessible by Infonet customers through the CSC telecommunications network and through ordinary dial-up or leased lines. The network capability includes both high-speed binary-synchronous communication and low-speed teletype-asynchronous compatible communication. CSVS binary-synchronous support is provided via the CSC telecommunications network for terminals compatible with both IBM 2780 and 3780 at speeds of up to 4800 bits per second. The binary-synchronous protocols for such terminals use the complete EBCDIC code set, including transparent text mode. The maximum block size supported is 600 characters per buffer; there is no limit on the number of records per block or on individual record sizes. Access at speeds of 9600 bps is supported on a dedicated line.

The following types of low-speed conversational terminals can access CSVS through CSCTN:

- TTY—compatible ASCII terminals at 110, 150, 300, 1200 bps (1200 bps full-duplex service);
- IBM 2741—compatible terminals at 134.5 bps in EBCD, RTS, or correspondence code; and
- IBM 3270—compatible in "Glass Teletype" mode.

IBM 3270 binary-synchronous terminals operating in "full-screen" mode are supported by CSVS through dial-up or leased lines only.

CSTS II

Computer Sciences Corporation has completed the transfer of the more than 2,000 user accounts of its Infonet remote computing network to an upgraded service based on larger computers and a new operating system. The company replaced the 16 Univac 1108s in its four North American data centers with six 1100/80-series machines.

A key element in the upgraded service is the Computer Sciences Teleprocessing System II (CSTS II), a new operating system based on the one that CSC originally developed to provide Infonet service.

The combination of more powerful hardware and software allows users to run larger tasks in less time. The expanded capability is of particular benefit in financial modeling and simulations common to many Infonet users, as well as in other applications calling for large memory and address space.

In addition, substantially more users will be able to access a common database. The feature will benefit the multinational companies and other organizations that typically consolidate sales and financial information from widespread locations in central databases on Infonet for analysis and reports. Other system features include improved language and data management functions, greater tape density, and even higher hardware reliability.

CSTS II was designed to make the transition from the prior system painless to current users. Because the system is upwardly compatible, most user programs can run on CSTS II without modification, and without recompiling or relinking.

IBM-Based Network Services

Simultaneous with the upgrade of CSTS service, Computer Sciences is expanding the IBM-based services it provides through the Infonet communications network. In December 1981, Infonet began revenue operations on an IBM 4341 Group 2 computer installed in the Beltsville center.

Computer Sciences Corporation (CSC)

The service currently runs on IBM 3081 and 3084 mainframe computers.

ON-LINE DATABASES

Computer Sciences Corporation no longer actively markets on-line databases.

OTHER PROFESSIONAL SERVICES

Contract Services

CSC's traditional technological base is a service performed to a client's contractual specifications. These services include:

- Development of custom-designed computer-based systems
- Implementation of computer/communications systems
- Operational support of a client's technical activities
- Information systems consulting and advisory services
- Providing a specific personnel skill or group of skills to fit a client's project requirements
- System integration and turnkey development of a system, wherein CSC provides all of the hardware, software, training, and related requirements for delivery of an operational system

Systems development and consulting activities range from consulting services in computer-related high technology fields to the provision of turnkey systems ready for use by the customer. Current major projects include the development for the U.S. Treasury Department of a secure, private packet switched network that will provide connections for 30,000 data terminals worldwide; and an integrated office information system encompassing 13,000 workstations for the U.S. Air Force.

CSC also supplied a nationwide information system to the Saudi Arabia Ministry of the Interior. CSC designed the system, provided computer software, supplied all of the computer and communications network switching equipment, and procured buildings and other structures required for the network.

Other current developmental activities in this area include an inventory and sales transaction system to service 800 branch offices of a home appliance dealer; consolidation of existing multiple voice and data networks for a state government with image transmissions into one integrated, state-of-the-art network; a turnkey information system for the hospital industry; software systems for shipboard weapons control, intercomputer networking, war-gaming, tactical data exchange, logistics and supply, antisubmarine warfare, intelligence, weapons and aircraft systems test, command and control communications, and other specialized needs of the armed forces; software to support activities of the National Aeronautics and Space Administration in such areas as flight planning and control, launch planning and control, worldwide tracking network control, simulation and modeling, business applications, and reduction of tracking, engineering, test, and payload data; software for air traffic control systems; and energy management control systems to automatically monitor and control energy use of heating, ventilating, and air-conditioning equipment at large-scale installations.

Facilities Management and Support Services

Facilities management and support services involve CSC's complete operation of a computer facility dedicated to the requirements of a single customer, including performing all programming and computer operations and, in some instances, providing the computer hardware. CSC performs facilities management services for certain agencies of the federal government, for state and local governments, and for commercial enterprises. NASA contracts CSC to support its principal centers for research and flight operations.

FUTURE PLANS

CSC's plans call for continued enhancement of all current services and the development of new services for emerging market needs. □

Construction Computer Control Corp. (CCC)

Construction Computer Control Corp., formed in 1968, provides time-shared sevices to construction contractors. Applications offered include payroll, labor cost control, accounts payable, accounts receivable, cash flow analysis, job cost analysis, inventory control, general ledger, a property management system, and more. Distributed processing applications are also offered using microcomputers tied into time-shared mainframes. CCS also provides consulting services to contractors through its Professional Services Group; and customer support services through its Clients Services Group.

COMPANY INFORMATION

Construction Computer Control Corp. (CCC)
615 E. Michigan Street
Milwaukee, WI 53202
Telephone (414) 278-0500

Company Background

Construction Computer Control Corp. was formed in 1968 to provide time-shared services to construction contractors. A privately held company that employs 40 people, their primary product is SYSTEM 5, which is used by over 400 contractors in all areas of construction.

Applications offered include payroll, labor cost control, accounts payable and receivable, cash flow analysis, job cost analysis, historical cost analysis, capital equipment control, inventory control, general ledger/financial statements, bid market strategy analysis, bid solicitation, shop drawing control, critical path scheduling, asphalt plant/ sand and gravel pit cost control, and a comprehensive property management system. Microcomputers tied into the time-shared mainframes support distributed processing applications. A host of distributed processing applications are offered.

Construction Computer also provides consulting services to contractors through a separate division, The Professional Services Group. Contractors who have existing in-house computer equipment hire the Group to help them determine whether or not they are getting the most from their data processing investment. Services also include helping contractors select new systems. Assistance is provided from problem definition through ultimate vendor selection and contract negotiations.

RESOURCES AND FACILITIES

Processing Centers

Construction Computer Control Corp. utilizes data centers in Milwaukee, WI; and Palo Alto, CA. Each data center supports multiple Burroughs B-7850s.

Customer Support Services

The company provides comprehensive customer training and on-going support through its Client Services Group. Services include comprehensive training classes, hot-line service, annual user update meetings, monitoring of microfiche reports during installation, creating custom job reports and financial reports, tailoring the system to the contractor's unique requirements, establishing chart of accounts and financial statement formats, and assistance in selling used computer equipment. User manuals are also provided. Special training seminars are also provided for more effective system use by project foremen and project management personnel.

Sales and Marketing Services

Construction Computer Control Corp. has sales offices in Milwaukee, WI and Honolulu, HI.

INDUSTRY-SPECIFIC SERVICES

Construction Computer Control Corp. provides remote computing services and data processing-related consulting services exclusively to the construction industry. The remote computing services, called SYSTEM 5, operate in an interactive and/or distributed processing environment. Communication to one of the three data centers is via Tymnet and is available at no charge to the contractor. Some of the key reasons over 400 contractors use SYSTEM 5 are:

- Knowledge and proven track record in automated systems for contractors.
- Client Services staff that "live" with the client and become his or her "employee" during training and conversion.
- No major investment in computer equipment that will become technologically obsolete in less than 3 years.
- No long term commitment, only a 30-day agreement.
- Unlimited computer and system flexibility, virtually eliminating concern of outgrowing the system.
- Immediate return on investment—completely operational with meaningful reporting within 60 days.

SYSTEM 5 is currently used by contractors ranging in size from one million in annual contract billing to over $350 million. The special requirements for all types of construction have been included: design/build, general contractor, mechanical, heavy/highway, underground, electrical, steel fabrication, and virtually all specialty trades. Cost control systems also encompass asphalt plants and sand and gravel pits. The property management requirements of residential and commercial developers are also handled by the system.

NETWORKING SERVICES

The Tymnet communications network is available to all system users.

▷

Construction Computer Control Corp. (CCC)

▻ ON-LINE DATABASES

Construction Computer Control Corp. supports no public on-line databases, although its clients' databases are on-line and available for processing.

OTHER PROFESSIONAL SERVICES

Construction Computer Control Corp. provides consulting services to contractors through its Professional Services Division. Contractors with their own in-house systems use this group to determine whether or not they are getting the most from their data processing investment. The Professional Services Division also provides help to contractors selecting new systems, from problem definition through ultimate vendor selection and contract negotiations.

FUTURE PLANS

CCC's future plans include expanded development of "distributed processing" applications for mainframe/microcomputer interface. ☐

Control Data Corporation

One of the computer industry's leaders, Control Data Corporation was founded in 1957 to develop computer systems for scientists and engineers. Today, the company's computer-related services include scientific and engineering applications, business data processing, engineering, education, consulting, health care, and small business services.

Many of Control Data's application programs are offered through the company's Scientific Information Services (SIS) subsidiary. SIS offers programs designed for a number of industries, including manufacturing, electric utilities, petroleum, electronic engineering, and engineering.

This report highlights Control Data's remote computing services. For further details on Control Data's Information Retrieval Services, see Report OL20-270-101 in Volume 1 of this Directory.

COMPANY INFORMATION

Control Data Corporation
8100 34th Avenue South, Box 0
Minneapolis, MN 55440
Telephone (612) 853-8100

Company Background

Founded in 1957, Control Data Corporation (CDC) provides a variety of products and services based on computer technologies. While by any measure Control Data remains one of the computer industry's leaders, the company has hit hard times recently. In fact, "Control Data's financial performance in 1985 was the worst in its history," according to the company's chair, Robert M. Price. Indeed, Control Data reported losses of $567.5 million for the year. To offset further losses, and to begin to rebuild, the company has taken the following steps:

- Divestitures or closings of businesses representing about 12 percent of the 1985 revenues for its computer business, and 35 percent of the revenues for its Commercial Credit subsidiary.
- Cut 10,000 from its workforce.
- Reduced its operating plant space by approximately 20 percent.

Control Data's strategy is to concentrate on those markets that it knows best, namely manufacturing, government, electric utilities, petroleum, higher education, and weather forecasting. Examples of how this strategy has previously paid off follow:

- Control Data is the vendor of choice for many electric utilities—23 percent of the generating power in the U.S. is controlled by Control Data energy management systems.
- In government defense, Control Data is the premier supplier of three standard government products: The Navy's AN/AYK-14 airborne computer; the M-1 tank's fire control computer; and the UYN-3 Navy standard disk.
- Control Data has integrated the hardware and software aspects of CAD/CAM (computer-aided design and manufacturing) to offer customers a total manufacturing solution in all steps of the manufacturing process.
- Over 300 CYBER computers are installed at 170 colleges and universities worldwide. These computers are used for a variety of functions including research, student coursework, networking microcomputers, administrative tasks, community and business outreach programs, and to deliver PLATO computer-based education.

Control Data's on-line data service components include the following:

Scientific Information Services (SIS)—SIS is a new Control Data subsidiary that was formed when Control Data combined the offerings of its United Information Services (UIS) subsidiary with its CYBERNET remote computing services. SIS, which provides solutions to customers' engineering, scientific, and operational problems, offers customers a broad set of applications from which to choose.

Arbitron Ratings Company—a broadcast (radio and television) audience measurement/survey company.

Business Information Services (BIS)—provides a wide variety of management information services to all levels of both government and industry managers. Major industries served include manufacturing, banking, brokerage, insurance, health care, communications, transportation, and government.

According to BIS, during the 1980s the company's services will be used to address users' application system requirements. An application system is a method by which the total information flow of a corporation is integrated to allow easy access to needed information through the use of one language (X/L). This approach requires the delivery and integration of such key elements as:

- Corporate proprietary internal data with external data services
- Compatibility with existing hardware
- An international data communications network

▻

- A comprehensive set of data management and analysis capabilities, including modeling, graphics, statistical analysis, etc.

- A complete support service, including local BIS marketing and systems professionals, education, documentation, and consulting

RESOURCES AND FACILITIES

Scientific Information Services

Processing Centers

Hardware. Scientific Information Services (SIS) operates more than 20 large-scale CYBER Series 800, IBM, and Digital Equipment Corporation VAX computers; plus CYBER 205, and CRAY 1-S supercomputers in its data services network. Control Data has also announced plans to acquire a CRAY X-MP/24 and an ETA 10 to upgrade its supercomputer data services network. The CRAY X-MP/24 will be commercially available in December 1986; the company plans to install the ETA 10 in fourth quarter 1987, and have it commercially available by the first half of 1988.

Hardware backup/protection includes:

- Uninterruptible power supply for computers and buildings
- Secondary electric service with automatic alarms and switching
- Backup systems for air-conditioning and water cooling
- Multiple linked mainframes
- Distributed processing
- Dual paths and controllers for all input/output
- Off-site file storage and backup

Languages

- APL
- Basic
- Cobol
- Compass
- Fortran
- Pascal
- Sympl

Customer Support Services

Control Data provides several support echelons. At the field level, there are professional services analysts and technical consultants who provide customers with implementation and training services. Central Hot Line Support is also available to provide guidance on system access, utilizing mainframes, and on using applications. Special training and other services are available to meet specific customer needs.

PROCESSING SERVICES

Pricing Information

Figures 1 and 3 (Pages RC20-270-103, -105) provide information on Control Data's CYBER, APEX, CETRA, DEC-10 mainframe, and CRAY-1 supercomputing charges, which apply in the U.S. (Figure 2 provides definitions of the terms included in the price schedules.) They do not include any applicable federal, state, or local taxes. Control Data expressly reserves the right to change prices upon 30 days prior written notice.

Contract Terms and Conditions

Scientific Information Services reserves the right to bill the customer for other charges that may be incurred in conjunction with the use of the services identified in the Service and Price Schedules.

INDUSTRY-SPECIFIC SERVICES

Scientific Information Services addresses engineers' needs through the integration of four capabilities—software applications and application systems, computing resources, telecommunications, and people support. These components are delivered in a distributed environment that includes desktop microcomputers, locally sited mainframes, and remote access to SIS data services.

SIS focuses on certain market segments:

- Electric Utilities—Construction engineering, nuclear engineering
- Electric/Electronic Engineering—Logic and circuit design and analysis
- Petroleum/Offshore—Reservoir simulation, pipeline design and operations, and offshore rig design and placement
- Government—Large-scale simulation, research and development, and large database applications
- Petrochemical—Plant mechanical process engineering

Mainframe-Based Applications

Electric Utilities—SIS provides application programs for:

- Nuclear fuel management
- Reactor safety analysis
- Probabalistic risk analysis
- Engineering and construction
- Plant mechanical application systems
- Power transmission
- Plant operation
- System operation
- EPRI applications
- Design drafting and management

1. COMPUTER SYSTEM USAGE

Charge per System Billing Unit (SBU)

NOS 175		NOS 176	
SERVICE LEVELS	**PRICE**	**SERVICE LEVELS**	**PRICE**
Interactive	$0.42	Interactive	$0.42
P6 Express	$0.33	P6 Express	$0.33
P4 Standard	$0.27	P4 Standard	$0.27
P3 Deferred	$0.21	P3 Deferred	$0.21
P2 Nonprime	$0.14	P2 Nonprime	$0.14
P1 Weekend	$0.09	P1 Weekend	$0.09

CYBER 200

SERVICE LEVELS	PRICE
P6	$0.33
P4	$0.27
P3	$0.21
P2	$0.14
P1	$0.09

2. ON-LINE STORAGE

Charge per Storage Data Block per day	$0.017
Charge per CYBER 200 Storage Data Block per day	$0.054
Charge per Extended Data Block per day (NOS Services)	$3.25

Volume Data Pak per month (Not available on CYBER 200)

10M Pak	$1,100.00/month
50M Pak	$4,800.00/month
100M Pak	$8,500.00/month

3. PRIVATE TERMINAL CONNECTION

Charge per Connect Hour

Interactive Terminals

Standard:

30-cps Local Dial-up	$9.00 plus $0.25 per 1,000 characters transferred to or from the terminal
30-cps INWATS	$21.00 plus $0.25 per 1,000 characters transferred to or from the terminal
120-cps Local Dial-up	$16.00 plus $0.12 per 1,000 characters transferred to or from the terminal
120-cps INWATS	$28.00 plus $0.12 per 1,000 characters transferred to or from the terminal

Customer Option:

30-cps Local Dial-up	$17.50
30-cps INWATS	$29.50
120-cps Local Dial-up	$31.00
120-cps INWATS	$44.00

4. MAGNETIC TAPE USAGE

CYBERNET tape reel storage	$0.30 per day
Customer tape reel storage	$0.15 per day
Tape processing	$3.00 per tape mounted, plus an additional $30.00 per hour if tape assigned for NOS Interactive Processing

5. ASSOCIATED SERVICES

Access from CYBERNET Service Centers

Charge per Input/Output Data Block (IODB) for work submitted at CYBERNET Service Centers	$0.03

CDC CYBERLINK

Charge per Data Block transferred between computers	$0.02

VOLUME USAGE DISCOUNT

Applies to Sections 1, 3, 4

Monthly Volume	Discount Amount
$0-$5,000	No discount
$5,000-$10,000	5% on amount over $5,000
$10,000-$20,000	$250 plus 10% on amount over $10,000
Over $20,000	$1,250 plus 15% on amount over $20,000

STORAGE VOLUME DISCOUNT

Applies to Section 2

Monthly Volume	Discount Amount
$0-$400	No discount
$400-$1,800	18% on amount over $400
$1,800-$7,200	$252 plus 40% on amount over $1,800
Over $7,200	$2,412 plus 50% on amount over $7,200

Figure 1. Scientific Information Services price schedule, in effect since January 1, 1985

1. **SYSTEM BILLING UNIT:** A System Billing Unit is the pricing component that accounts for resources used (for example, CPU, memory, I/O) during execution of a customer's job.

2. **SERVICE LEVELS:** The level of service obtained is determined by the job priority specified by the customer. Higher priority jobs will process at a faster rate than lower priority jobs.

   Service Level P3 through P6 (Prime) jobs are initiated during all periods of operation.

   Service Level P2 jobs are initiated during Nonprime (after 7:00 p.m. local center time, Monday through Friday, and all day Saturday and Sunday).

   Service Level P1 jobs are initiated weekends (after 7:00 p.m. local center time, Friday, and all day Saturday and Sunday).

   All CYBER 200 interactive-initiated processing, regardless of actual processing Service Level, is priced at the Interactive Service price.

3. **DATA BLOCKS:** A Data Block is used as the measure for on-line storage and input/output volumes when processing on CYBERNET Services.

   A Standard Data Block is 1,280 6-bit characters in length, and is used as a Storage Data Block (SDB) and an Input/Output Data Block (IODB) on CYBERNET NOS 175 and NOS 176 Services.

   A CYBER 200 Storage Data Block is 512 64-bit words.

   An Extended Data Block (XDB) consists of 512,000 6-bit characters and is used as the measure for all Extended Direct Access on-line storage. Extended Direct Access files are requested via a NOS Control Statement.

4. **VOLUME DATA PAK:** A Volume Data Pak consists of 10 million, 6-bit characters for the 10M Pak, 50 million, 6-bit characters for the 50M Pak, and 100 million, 6-bit characters for the 100M Pak, and is used as the fixed measure of on-line storage on a monthly package basis. Storage used in excess of the Volume Data Pak will be charged at the standard charge for SDBs. The Volume Data Pak is provided at the Customer's Client Number level. Volume Data Paks are not offered on CYBER 200 Service.

   The addition or cancellation of Volume Data Paks requires thirty (30) days prior written notice from the customer.

5. **MINIMUM CHARGE:** A Minimum Charge of $200 applies to each Client Number for each monthly billing period. Control Data will waive the Minimum Charge when the dollar amount of actual usage exceeds $200 during the billing period or when the cumulative dollar amount of charges invoiced (less credits), during a calendar year, exceeds $2,400. When cumulative net charges, during a calendar year, exceed $2,400, (or $200 per month, prorated for a partial year, beginning with the month during which Control Data accepted the Agreement), all amounts billed for the difference between the actual usage, in a month and the monthly Minimum Charge, will be credited against the net charges over $2,400. A new customer will be exempted from the Minimum Charge until the Agreement has been effective for two monthly billing periods.

Figure 2. Service and price schedule definitions

▷ *Manufacturing—*

- Mechanical design and analysis
- Computer-aided engineering
- Electronic design, analysis, simulation, and testing

Design Engineering/Construction—

- Structural design and analysis
- Piping design and analysis
- Process engineering simulation
- Civil/geotechnical
- Energy analysis
- Electric systems design
- Hydrology

Electronic Engineering—

- Logic design and analysis
- Circuit design and analysis

Management—

- Database
- Graphics
- Project planning
- Linear programming/optimization
- Statistics
- Simulation
- Refining/process engineering—

Petroleum—

- Exploration
  - Seismic processing and modeling
  - Remote sensing/image processing
  - Pattern analysis
  - Magnetics
  - Gravity
  - Land management

- Production

  - Reservoir simulation
  - Production engineering
  - Off-shore structural engineering and design

On-site CYBER 800 Series in Selected Market Segments—

- The economics of a local system with the support, software, and capabilities of a service. ▷

OFF-LINE I/O PROCESSING	
0-2 Hours Turnaround	$110.00 per hour
> 2 Hours Turnaround	$ 60.00 per hour
OFF-LINE PRINTING	
One-part Paper	$ 0.07 per output page
Multipart Paper	$ 0.01 per page for each additional page plus $16.00 setup charge
Printer Forms Charge	$16.00 setup charge
OFF-LINE PLOTTING	
Pen Plotting	
12″-22″ Plotter	
0-2 Hours Turnaround	$ 65.00 per hour
> 2 Hours Turnaround	$ 45.00 per hour
30″-36″ Plotter	
0-2 Hours Turnaround	$120.00 per hour
> 2 Hours Turnaround	$100.00 per hour
Versatek Plotting	
Setup Charge	$ 21.50
Plain Paper	$ 0.55 per foot
Vellum Paper	$ 0.75 per foot
Mylar	$ 3.25 per foot
Delivery charges not included.	
OTHER OFF-LINE SERVICES	
Miscellaneous Services	$20.00 per hour
WALK-IN USE OF SERVICE CENTERS	
Interactive Terminal (30 cps)	$15.00 per hour
Interactive Terminal (120 cps)	$20.00 per hour
Tektronix (120 cps)	$25.00 per hour
Voice grade Batch Terminal	$75.00 per hour
BILLING SERVICES	
Customer Summary File	$50.00 per file
Supplementary billing information provided at additional charge.	
COMMITTED SERVICE BLOCK TIME	
(When available; one-hour minimum)	
CYBER 175	$2,000.00 per hour
CYBER 170-760	$2,500.00 per hour
CYBER 176	$3,250.00 per hour
CYBER 200	$6,000.00 per hour

Figure 3. Center and public terminal miscellaneous services

▷

- Comprehensive set of tested, integrated, supported applications.
- Tailored to the utilities industry and selected market segments.
- Compatible with the SIS network service. Provides a link to a SIS parent center for peak processing needs, access to special software, and for backup.

Microcomputer-Based Engineering Applications

The CYBERNET*EXPRESS Engineering Application Systems provide affordable, integrated engineering application systems, according to Control Data. These systems are matched to the generic and specialized needs of a wide range of engineering disciplines. Based on an IBM PC AT, XT, or compatible microcomputer, CYBERNET*EXPRESS provides easy-to-use, menu-driven, state-of-the-art application software for both standalone processing and data preparation as well as linkage to Control Data-supplied large mainframes and supercomputers.

The product set includes:

- Power Systems—Used by electrical engineers for design and retrofit of in-plant electrical power distribution systems.
- Structures—Used by civil, aerospace, and mechanical engineers, this system provides three flexible desktop processing tools for solving complex structural analysis problems.
- Electronics Designer—Used by electronic engineers, the system delivers a micro-based CAD capability that ranges from schematic capture and netlist extraction, to logic simulation and verification linking, to final layout.
- Piping—Used by mechanical engineers and piping designers, this product generates stress analysis, support optimization, and analysis drawings for complex piping systems in nuclear, fossil fuel electric generating plants, petroleum refineries, and chemical or food process facilities.
- Plant Designer—Used by design engineers, the system combines high-resolution color graphics with relational database management to deliver 3-D plant modeling, material takeoff, and generation of fabrication drawing.
- Project Manager—Used by project management and scheduling professionals, the system provides resource management matched against critical schedules of activities needed to complete a given project.

APPLICATION-SPECIFIC SERVICES

Scientific Information Services

In addition to the industry-specific application programs available through Scientific Information Services, Control Data offers application-specific systems via its network service.

The *Information Processing Family (IPF)* is an interactive centralized database with features including file definition, maintenance and querying, as well as capabilities for application development. The *Interactive Financial Planning System (IFPS)* provides analysis and information on lease versus buy, cash flow, resource allocation, equipment acquisitions, budgets, cash planning, and P&L planning. IFPS can also be used for sales forecasting, investment evaluations, merger and acquisition analysis, cost estimating, labor contract evaluation, corporate modeling, and ▷

profit projections. *IFPS/DATASPAN* provides a file transformation capability. *IFPS/SENTRY* prompts for additional data and checks the accuracy of entries. *PLOTPAC* is a graphics module that aids in spotting trends, showing numerical relationships, and presenting pertinent facts.

PROPLAN is a project control system for resource allocation and scheduling complex projects. *EZPERT*, a graphics postprocessor for PROPLAN, generates charts and diagrams. *APEX IV* is an advanced mathematical programming system for production scheduling, process optimization, blending, economic modeling, planning, transportation, and distribution studies.

BUSINESS INFORMATION SERVICES

Control Data's Business Information Services provide a wide variety of information services to all levels of management. BIS also uses proprietary systems, such as X/L, to develop custom solution systems for the management information needs of its clients. BIS also provides industry-specific applications services. Representative of these are the following:

The *HOSPITAL/MAP* system integrates case mix, DRG analysis, and management planning on a hospital-wide basis. More than 60 predefined reports are available to help meet the information needs for financial management, utilization review, strategic planning, quality assurance, operations, and administration. In addition to the standardized reports, the HOSPITAL/MAP customizing capability permits the creation of new report formats.

The *MARKSMAN Application Service*, a marketing management service, is designed specifically to support the functions performed by a marketing department. MARKSMAN is comprised of three units for analyzing markets; developing, implementing, and monitoring plans; and scheduling and controlling activities. Each MARKSMAN unit can be used separately or as a full-scale approach to marketing management support. The MARKSMAN Application Service provides reporting, information handling, inquiry, and maintenance capabilities, and information access can be regulated according to authorization levels. Each level of management receives information consolidated to its needs. A dialogue using standard marketing terms allows the user to:

- obtain quick status reports.
- temporarily change the data for "What if" analysis.
- produce standard reports.
- use powerful statistical capabilities.
- access data in graphic format.
- ask for help at any point in the dialogue for a full explanation of options.

The *VALPORT Portfolio Valuation System* is designed to assist stockbrokers, investment banking firms, bank trust departments, investment managers, and others involved with the study and valuation of securities. The system produces formal portfolio valuation reports, suitable for presentation to a client or prospect. VALPORT accesses a master securities file containing over 60,000 securities, including those listed on all major exchanges and all actively traded, over-the-counter issues.

The *Foreign Exchange System* is designed to assist international banking departments in foreign exchange trading and due-from-bank ledger accounting. The system accepts information about contracts to buy or sell foreign currency, automatically prints the contracts, and stores the information. It also enables the user to compute the spot profit or loss on transactions with all ledger banks, and a project forward profit on outstanding foreign exchange contracts. Numerous standard and custom reports can be generated by the system.

X/ISSUE is an X/L-based system for issuing certificates of deposit and commercial paper. X/ISSUE is designed to meet the needs of banks and corporations active in the short-term money market. The system uses a menu-driven format to handle the note issuance, operation control, and management information aspects of the issuing process. The X/ISSUE system handles a wide variety of instrument types, allows simultaneous input from multiple locations, and is operationally simple for easy training and start-up. The system also provides a full range of management reports, as well as user-customized menus and reports.

The *Saletech Life Insurance Illustration System*, developed by Compensation Resources, Inc. (CRI), is designed to meet management, marketing, and actuarial needs in the home office and agent requirements in the field. Its capabilities include illustrations, such as ledger statements, split dollar, flexible deposit, and deferred compensation; virtually unlimited customization capabilities; and access from both the home and branch offices.

X/Toll is a telecommunications marketing and network planning system enabling users to examine industry characteristics such as NPA-NNX, LATA, and toll minutes per day for the purpose of targeting marketing efforts. Analysis can be used to provide input to such areas as market potential, future network capability, prospect evaluation, and estimating toll call usage.

BIS offers a broad array of application systems designed specifically for the manufacturing industry, including fabrication and assembly operations, as well as process industries. These systems cover all functions within a manufacturing company: management decision support, planning, production, inventory, engineering, finance, accounting, and marketing. Grouped under the name *X/MFG*, these systems are designed so that they can be easily customized to fit user requirements. Systems such as inventory, purchasing, and product structure can operate with user programs and databases, or they can all be integrated to work as a combined system.

FINANCIAL INDUSTRY SERVICES

Credit Union Services provides share and loan processing and general financial services to credit unions via batch, on-line, in-house, and distributed modes. It can handle the bookkeeping functions for credit unions of all sizes. Credit Union Services produces member statements and management reports. In addition, the capabilities include sharedraft processing, on-line check and receipt processing, delinquency reporting, on-line general ledger and member account transaction history, mortgage processing, VISA card issuance and processing, ATM (automated teller machine) services, and financial planning.

Banking Data Services (BDS) features a system of demand-deposit, savings, loan, and general ledger accounting to commercial banks in the $10 to $200 million deposit range. BDS offers its services in the on-line mode.

ACTION Data Services provides transaction reporting, on-line, and distributed data processing services to the consumer finance industry. Control Data acquired ACTION from ITT in the early 1970s. Since that time, it has grown to become a system that processes more than 300,000 transactions per day. Through its computer center in St. Louis, ACTION handles consumer and commercial loan transaction processing, account status reporting and maintenance, and certificate of deposit and passcard thrift account processing and reporting.

In addition, ACTION manages Control Data's CYBERCREDIT service, an on-line service that provides financial institutions, hospitals, and retailers with a means of collecting on delinquent accounts. Control Data developed the CYBERCREDIT system for Citicorp in 1977, and shortly thereafter offered the service nationwide. CYBERCREDIT is an automated collection control system that includes hardware, software, and peripherals at the user location.

EFT Data Services includes check guarantee and credit card verification and authorization to financial institutions, which, in turn, offer those services to their commercial customers. EFT's TeleMoney service is an on-line transaction system operating through a network, with terminals located in retail stores. Payment is processed faster and retailers can confidently accept personal checks and credit cards as a result of using TeleMoney.

BROKERAGE SERVICES

Brokerage Transaction Services, Inc. (BTSI) provides securities-related data processing services to the brokerage and banking industries. The major service offerings include a brokerage accounting system that supports firms which provide a full range of brokerage services, as well as firms specializing in particular areas, such as trading and money management, and a message and order processing system that controls the flow of orders and execution reports to and from areas where trading takes place, including all exchanges. BTSI also provides a variety of account information to its customers' registered representatives via desktop terminals.

Electronic Trading Services combines the technologies of modern communications and data processing for the trading of equity services in an automated environment. This service allows brokers and market makers to execute purchases and sales of listed securities efficiently and economically via a direct computer link to the system.

NETWORKING SERVICES

Scientific Information Services

Accessing the Scientific Information Services data communications network is possible in both interactive and batch processing modes. Local interactive access is available in more than 250 cities worldwide via dial-direct telephone lines. The interactive mode is handled through the NOS operating system. Remote batch access, via toll-free numbers, is supported by the SCOPE 3.4, NOS, and Cyber 200-OS operating systems.

Scientific Information Services offers two methods of accessing U.S. SIS systems internationally. The first method is by the Data Services Network (DSN). This service consists of equipment Control Data has installed to provide users local access by calling a local access number. The log-on procedure is the same as it is in the United States. The connect charge is based upon the standard contract rate in the country where the customer enters the network.

The second method of accessing U.S. Scientific Information Services is through an intermediate network known as International Packet Switching (IPS). IPS is primarily a 30-cps service. Control Data has contracted with an International Record Carrier to provide a DSN connection to a switch in the United States, which is tied by satellite circuits to overseas communications switches. In order to use this service, the customer has to contract with the local telephone company in the country where the service is available. The telephone company provides the user with instructions on how to connect to a switch, and a network charge number with log-on instructions. The physical connection to the switch is dial-up in some countries and dedicated line service in other countries.

OTHER PROFESSIONAL SERVICES

Training

Control Data's PLATO system, which incorporates hardware, software, and "courseware," has proven itself in several industries as an effective, efficient, and flexible way to train employees. PLATO trains electric utility dispatchers, nuclear plant operators, stockbrokers, and everyone from airline pilots and maintenance personnel to industrial factory workers in the use of new equipment.

Technical Consulting and Support

Control Data's Technical Support Services provide customers with a wide range of consulting, training, and computer maintenance solutions. Maintenance services provide comprehensive hardware maintenance for Control Data, IBM, Digital Equipment Corporation, and other

▷ manufacturers' computers. Control Data is one of the three largest computer maintenance services organizations in the world, and, according to the company, is the only one providing complete services from microcomputers to mainframes. PLATO is one of the largest training solutions available to business, industry, and government, while Professional Services consulting can tailor a hardware or services solution to fit a customer's requirements.

Data Storage Products

In Data Storage Products, Control Data is the leading independent manufacturer of high-capacity, high-performance storage devices to original equipment manufacturers (OEMs). The company claims that it is maintaining that position by continually introducing larger capacity products at lower prices. □

Dialcom, Inc.

Dialcom, Inc., a wholly owned subsidiary of British Telecom, offers worldwide electronic messaging, information, and value-added application products. Founded in 1970, the company operates a widely used electronic mail service for business and government subscribers. Its other services include electronic publishing, correspondence and mailing systems, database management systems, file transfer capabilities, and PC-based systems such as PCMAIL.

Dialcom offers its subscribers access to several news and information services including *ABI/INFORM, AP Associated Press Videotex Service, BNA Online, Bunker Ramo Stock Reports, Official Airline Guides (OAG)*, the OPEC and UPI newswire services, and a gateway to Dow Jones News/Retrieval.

COMPANY INFORMATION

Dialcom, Inc.
6120 Executive Boulevard
Rockville, MD 20852
Telephone (301) 881-9020

Company Background

Dialcom, Inc. was founded in 1970 to provide time-sharing services. In 1982, the company was acquired by ITT Corporation and it remained a subsidiary of ITT until May 1986, when it was acquired by British Telecom. Dialcom is now considered one of the leading vendors of on-line and electronic mail services for business and government. It serves more than 200,000 users based in approximately 2,000 U.S. companies and government agencies, as well as partners abroad.

Shortly after its founding, Dialcom embarked on a vigorous acquisitions program. Within two years it had acquired the assets of several smaller time-sharing companies, greatly expanding its market base. In the mid-1970s, Dialcom began developing applications software for the office automation marketplace, anticipating a decrease in the demand for time-sharing services. During this time, the company also decided to make electronic mail the cornerstone of its product line. In 1975, Dialcom began developing its electronic mail system in earnest.

Today, Dialcom's primary service is electronic mail, just as the company had envisioned in 1975. By any measure, Dialcom is a leading vendor of electronic mail services, both nationally and internationally. Nationally, its services are used by many *Fortune* 1000 companies as well as government agencies. Internationally, Dialcom's Global Mail Network links identical systems in the United Kingdom, Canada, West Germany, The Netherlands, Puerto Rico, the U.S. Virgin Islands, Australia, Hong Kong, Singapore, Korea, and Denmark. Through Dialcom's XMAIL service, users have the option of sending electronic mail to any of the more than 200,000 public telex terminals in the U.S., and more than 1.8 million overseas. The Dialcom service also interfaces with TWX, Mailgram, and Cablegram.

In addition to its electronic mail service, Dialcom offers information retrieval services geared toward businesses and government.

Dialcom has embarked on a sweeping expansion program since its acquisition by British Telecom, the leading United Kingdom communications firm. It has consolidated its domestic and international operations in a new headquarters based in Rockville, MD and opened new branch offices in the U.S. and abroad. It addition, the company has introduced its X.400 message handling system, which permits easy and instant computerized message handling among dissimilar systems. Following the successful demonstration of this system at the CeBIT '87 telecommunications exhibition (March 1987), Dialcom announced plans for its implementation on an international scale.

RESOURCES AND FACILITIES

Processing Center

Dialcom recently moved into a newly constructed building in Rockville, MD. The new center has more than 12,000 square feet of floor space for computer equipment, with an additional 20 percent allocated for expansion. Two uninterruptible power supplies are featured to protect its computers from power surges and dips.

Dialcom's fleet of more than 90 computers worldwide include Prime 750s, 850s, and 9955s.

Systems Software

Dialcom uses a customized version of the Primos operating system on its host computers. The applications software for specific products, such as electronic mail and electronic publishing, are written in Fortran and Fortran 77, although some new products are being developed in the PL/1 and C languages.

Customer Support Services

Dialcom's support organization strives to properly introduce users to office automation concepts and applications. Each installation is tailored to the specific needs of the client (for example, Dialcom will create customized menus). In addition, Dialcom will send members of its training and consulting teams to the user's site to introduce office systems and explain system applications. Training

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can be given in a classroom, in individual sessions, or to the client's own team of instructors.

Dialcom's client consultants also provide services in other areas, such as terminal selection, special software needs, communications, database management design, and any other computer-related office need.

Sales and Marketing Services

Dialcom maintains marketing branches in New York, NY; Cambridge, MA; Washington, DC; San Francisco, CA; Des Plaines, IL; Houston, TX; and London, England. Its messaging products are offered worldwide through 16 international licensees.

System Security

Dialcom's computer system is protected by a variety of security features, including hardware, software, and physical protection measures. These precautions protect both the overall integrity of the system and the individual user's access to the system. In addition, Dialcom has developed proprietary features that enhance its security.

Some of the major nonproprietary features of Dialcom's system include:

- Automatic line disconnect, to prevent random access
- Access virtual control panel via software only, to prevent physical access to the Prime hardware
- Key software maintained separately from user access
- Encryption of all password information
- Time and day of last log in display for each new log in, to alert users of possible illegal access
- User capability to change personal password as frequently as desired
- Console log of all illegal login attempts, monitored periodically to detect a personal computer attempting random passwords
- Access to electronic mail is restricted to the message recipient; not even a member of the Dialcom staff can access a user's mailbox
- Private message confidentiality option through use of a message-specific password
- Password length flexibility (up to 30 characters)
- Password expiration every 60 days

PROCESSING SERVICES

Pricing

See Table 1 for Dialcom's price schedule, effective May 1987.

APPLICATION-SPECIFIC SERVICES

Dialcom considers electronic mail to be the hub of its value-added messaging and information services. Its electronic mail system is integrated with other international and domestic communications services, including Telex I/Telex II, Cablegrams, and Telegrams. Additional communications systems include bulletin boards (both public and private), teleconferencing, and interterminal "chatting."

Electronic Mail

Dialcom, one of the earliest entrants in the electronic mail market, developed its system in the mid-1970s. Like any electronic mail system, Dialcom's offering uses a computer to process person-to-person communications, permitting instantaneous, around-the-clock transmissions of most forms of office communications. Users access system functions via plain-English commands. Conversations and reading, filing, retrieval, posting, and updating of intra- or interfacility messages can be transmitted. A HELP command provides tutorial guides when requested. Automated distribution lists and text editing capabilities also enhance message transmissions.

As previously mentioned, Dialcom has integrated its electronic mail service with other communications services. These services include:

- *WPMAIL*—a special program that allows noncompatible word processors to "talk" to one another. As such, it will transmit "clear" text from, for example, a Lanier diskette to a Wang. Additionally, if the communicating word processors are "like" terminals using identical codes for tabs, underlining, etc., this information can also be exchanged.

- *PCMAIL*—a PC-based mail transfer system that enables users to send mail messages created off-line on a PC through the Dialcom mail service to other users.

- *Telex Interface*—can be used to add over a million delivery locations around the world for Telex Messages, Mailgrams, Cablegrams, and Telegrams.

Electronic Bulletin Board

Subscribers can post announcements, policy and guidance statements, job openings, and other information. Users may respond directly to the individual or post the response on their system.

Electronic Publishing

With Dialcom's EPUB software, users can create their own electronic publishing center to publish newsletters, press releases, technical or financial reports, and product or service bulletins. The system is capable of permitting or restricting information accessibility on a person-by-person basis. In addition, the system is custom-tailored to provide easy-to-use menus with options for scanning headlines or titles, reading items in their entirety, or full text searching. Another feature permits users to create a personal file of search terms. When data is loaded into the system and it matches the profile, the system automatically mails the items to the user's electronic mailbox.

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Dialcom, Inc.

File Transfer Services

FT—a file transfer service that allows users to transfer both single and batch files between PCs and the Dialcom on-line system. The service interfaces with the Dialcom mail service and it works with the selected communications package. FT provides error detection and correction for the transfer session.

FT is compatible with popular communications packages. Currently, FT supports the Xmodem, Ymodem, and Kermit protocols.

XMIT—a file transfer service that allows users to transfer ASCII text files between a PC or word processor and the Dialcom on-line system.

Executive Calendar System

Dialcom's calendar system enables users to scan the schedules of up to 15 people at once; display open time slots; check the availability of the conference room or slide projector; and place a meeting in all schedules—all with a single entry.

Scheduled items can be tagged as Accepted, Tentatively Accepted, Pending, Declined, Cancelled, or Just a Reminder. Changes in status, date, time, or appointment details, such as room changes or attendee lists, can be easily made.

Word and Text Processing

The word and text processing system provides capabilities for text input, editing, and formatting and includes a 56,000-word dictionary for spelling verification. (Multilevel dictionaries may also be created to accommodate company and individual needs.) Other system features include simple commands for global changes, insertions, deletions, margin justification, and paragraph repositioning.

Database Management System (INFOX)

Dialcom's database management system offers data entry, update, query, and computational capabilities for information entry, update query, and report writing. It features plain-English commands, a data dictionary to define file structure, formatted screen development, user-oriented menus, and prompting. Other features include on-line updating, simultaneous file access for transactions, query-type information selection, report generation from multiple files, and sorting capabilities. The system manages:

- Business systems, such as inventory, order entry, accounts payable, and accounts receivable
- Tracking systems for correspondence, grants and loans, procurement, profiles, and competitive data
- Personal systems, such as corporate and individual directories, expense reports, and logs

Correspondence Management

The correspondence and list management system provides tools to automate tasks associated with the production of mailing lists, letters, envelopes, labels, postcards, and directories. Mailing list management facilities include automatic merging, matching, and name search functions to prevent duplication. Mass mailings and correspondence tracking, filing, and retrieval are also accommodated.

NETWORKING SERVICES

Dialcom operates an asynchronous and synchronous X.25 computer network, which can support more than 1,200 simultaneous users. The network offers 600 local dial-up 300/1200 baud asynchronous lines either connected to its processor directly or through its X.25 network. The Dialcom network is accessible, with the appropriate log on ID and password, from any type of ASCII terminal.

Dialcom is also accessible through Telenet and Tymnet, with nationwide access available at any nodes of those Value-Added Networks (VANs). Consequently, if the user's local node is down, he or she has the option of using another route to get onto the system.

ON-LINE DATABASES

Dialcom offers a number of information products in keeping with the interests of its target market—*Fortune* 1000 companies. These products include electronic newswires, travel services, and bibliographic databases. Most of the databases described below are profiled in the On-line Databases Tab (OL40) in Volume 1 of this Directory.

Business and Management Information

ABI/Inform—provides worldwide coverage of business and management information appearing in more than 650 publications. The database consists of 200-word summaries (abstracts) of the principal articles appearing in leading business journals.

Business Wire—contains the full text of press releases issued by corporations and institutions traded on the New York and American stock exchanges, as well as OTC companies. Over 9,000 companies now use Business Wire for electronic dissemination of their releases.

Daily Tax Report—offers up-to-the-minute information on business accounting and tax news. It is produced by the Bureau of National Affairs.

SEC Advance—contains the full text of the daily Securities and Exchange Commission's News Digest; it is produced by the Bureau of National Affairs.

News

Electronic News Service—provides electronic access to UPI, AP, and OPEC newswires. In addition, the latest stock

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PRICE SCHEDULE

Contract Term[1]	Thirty Days ($)	One Year ($)
Monthly Account Fee[2]	100.00	100.00
Monthly Usage Minimum[3]		
first six months	None	None
after six months	500.00	2,500.00
Monthly Storage and Discounts[4]		
Per Storage Block for Units		
Between 1-2,500 Blocks	0.50	0.50
2,501-5,000 Blocks	0.45	0.35
Over 5,000 Blocks	0.40	0.25
Electronic Mail Storage[5]		
• unread, unfiled messages up to 15 days	NC	NC
• read, unfiled messages up to five days	NC	NC
Hourly Connect and Discounts[6,7]		
Per Connect Hour for Units		
Between 1-75 Prime Hours	14.00	13.30
76-150 Prime Hours	13.60	12.60
Over 150 Prime Hours	13.00	11.90
Between 1-75 Non-Prime Hours	6.50	6.20
76-150 Non-Prime Hours	6.30	5.85
Over 150 Non-Prime Hours	6.05	5.55
Kilocharacter Traffic[8]		
Per Kilocharacter for Units	0.05	0.05

	Prime ($)	Non-Prime ($)
Network Communications[9]		
(300-9600 bps) per hour		
Telenet	5.00	4.00
Datapac, Tymnet, Dialcom, Network	7.00	6.00
Public 800 WATS	30.00	30.00

Premium Products and Services[10]	Cost ($)
Value-Added Messaging	
International Dialcom Electronic Mail[11]	
Per Message per 1,000-Character Unit	0.50
XMAIL[12]	
User Registrations, per User	5.00
Domestic Telexes	Rates Vary by Carrier (Available On-line)
Domestic Mailgrams	Rates Available On-line
International Telexes and Cablegrams	Rates Vary by Country (Available On-line)

Special Applications	Prime[7] ($)	Non-Prime[7] ($)
Bulletin Board and Conferencing Services		
RSVP	4.00	4.00
TRADEPOST		
Per Item Posted	0.15	0.15
EPUB Electronic Publishing Service	6.00	5.00
File Trasnfer Services[13]		
FT,PCMAIL,WPMAIL,XMIT	2.00	2.00
INFOX Database Management System	6.00	5.00
per CPU Second	0.10	0.05
NETLINK Gateway Link[14]		
Gateway to U.S. Systems	2.00	2.00
Gateway to U.S. Systems (Collect Network Call)	8.00	8.00
Gateway to International Systems	17.00	17.00
PERFORM Electronic Forms Processing		
Per 1,000-Character Unit	0.05	0.05

UpFront PC Package	See Price Schedule Supplement

Premium Products and Services[10]	Prime[7] ($)	Non-Prime[7] ($)
News and Information Services[10]		
ABI/INFORM Business and Management Journals Library	65.00	65.00
AP Associated Press Videotex Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25
BNA ONLINE Bureau of National Affairs Database	65.00	65.00
BUNKER RAMO Stock Reports	18.00	15.00
BUSINESS WIRE Service	30.00	30.00
Per NEWS-TAB Story Mailed	0.30	0.30
Federal Government News Services		
FAR ONLINE Federal Acquisitions Regulations on Government Contracting Requirements	32.00	32.00
FEDNEWS Government Agency News Services	18.00	15.00
FEDWIRE News Briefing Transcripts From White House, State and Defense Departments	20.00	20.00
IMTS International Medical Tribune Syndicate Health and Medical News	18.00	15.00
NEWS-TAB Electronic News Clipping Service		
Per Term per Day	1.00	1.00
Per Story Mailed	See Newswires	
OAG Official Airline Guides[15]		
Per minute	0.25	0.20
per page of schedules	0.35	0.25
per page of hotels, motels	0.35	0.25
per page of fares, rules	0.50	0.35
OPEC Newswire Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25
UMI Article Ordering Service	20.00	12.00

Table 1. Dialcom, Inc.'s price schedule, effective May 1987.

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Dialcom, Inc.

Premium Products and Services (Cont.)		
UNISTOX UPI Stock Reports	18.00	15.00
UPI Newswire Service	18.00	15.00
Per NEWS-TAB Story Mailed	0.25	0.25

News and Information Services	Prime $		Non-Prime $	
Baud Rate	300	1200	300	1200
DOW JONES NEWS/RETRIEVAL[16]				
Business and Economic News				
per minute	0.95	2.33	0.13	0.29
per minute (text search)	0.95	2.33	0.62	1.40
Financial and Investment Services				
per minute	0.95	2.33	0.62	1.40
per hit (Disclosure II)	6.00	6.00	2.00	2.00
per hit (Investext)	6.00	6.00	2.00	2.00
per hit (Quicksearch)	39.00	39.00	39.00	39.00
Dow Jones Quotes				
per minute	0.65	1.67	0.13	0.29
Japan Economic Daily				
per minute	0.64	1.67	0.13	0.29
General News and Information				
per minute	0.65	1.67	0.13	0.29
Track				
per month	5.00	5.00	5.00	5.00
Brokerage				
per minute	0.65	1.67	0.13	0.29
per month	5.00	5.00	5.00	5.00

Support and Related Services

Customer Support Services[17]	Cost ($)
Per Hour	
Account Training	50.00
Teach the Teacher	50.00
System Manager Services	50.00
Custom EPUB Installation	50.00
Custom Programming Services	
Per Day (Plus Travel and Reimbursables)	600.00

Special Billing Reports[18] Per Month	On-line ($)	Via Tape ($)
CONTRACT Summary (Invoice Format)	50.00	200.00
DIVISION Summary Report	50.00	200.00
DEPARTMENT Summary Report	50.00	200.00
USER ID Summary Report	50.00	200.00
USAGE Summary Report	100.00	300.00
All Summary Report	250.00	500.00
Electronic Mail Statistical Reports	250.00	500.00
Billing Transactions (INFOX or EBCDIC Format)	250.00	500.00

Magnetic Tapes	
Purchase, per Reel	30.00
Storage, per Reel	20.00
Access, per Access	10.00
High Speed Printing	
Per Page	0.20
Delivery and Handling	
Via UPS, USPS, Air Freight, Courier	Cost + 20 percent
Via Dialcom Courier	
Per Pickup or Delivery (Local Washington, DC Area)	20.00

Support and Related Services

Documentation	Per Copy ($)
Dialcom Services Users' Guide[19]	
1-25 Copies	36.00
26-50 Copies	34.00
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101+ Copies	29.00
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1-200 Copies	3.00
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DOW JONES NEWS/RETRIEVAL Users' Guide	9.95
EPUB System Manager's Manual	20.00
LEARN Users' Guide	NC
System Manager's Manual	30.00
UMI Article Clearinghouse Catalog	NC
Reference Cards ABI/INFORM, BNA ONLINE, OAG, TELENET, UMI	NC
Other user guides are available for products as they are offered. Prices are published on-line.	

NC—No charge.

Table 1. (Cont.)

Notes

Unless otherwise agreed, service is subject to the Terms and Conditions of the Dialcom Service Agreement. Users are responsible for the use, application, and results obtained from services selected.

This Price Schedule does not include all Dialcom services, and use of any service not listed will result in applicable charges. All on-line displays of usage statistics are approximations and are supplied for the user's convenience. Unless otherwise noted, all charges per measure of product/service are for said measure or fraction thereof.

[1] Thirty-day term pricing applies unless the user elects the one-year term by contract addendum.

[2] The Monthly Account Fee is a monthly charge in addition to usage charges. This account fee is incurred for each invoice sent to the customer.

[3] All usage charges apply to the Monthly Minimum. For new clients, the Monthly Usage Minimum does not go into effect until the beginning of the seventh full month of service.

[4] Monthly Storage charges are based on the monthly average of storage blocks that reside on the system at the end of each day. One storage block is equal to 2,048 characters, where each fraction of a block is charged as a full storage unit. The minimum unit per user ID is one storage block. The minimum unit per filed electronic mail message is also one block.

Applications with utilities for search and retrieval, shared directories, or group parameter initialization will incur additional storage units to support the application file structures. These include CALENDAR, EPUB, INFOX, MAIL, PERFORM, bulletin boards, and menu controllers.

Discounted rates apply to those portions of units in the specified ranges.

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Dialcom, Inc.

Notes (Cont.)

[5] Dialcom allows a grace period (free storage) of 15 days for reading unread, unfiled messages and five days for deleting unfiled messages once they have been read. After the grace period, the messages are automatically stored in the user's mail files and are subject to applicable Monthly Storage charges.

[6] The minimum connect unit is one minute. Dialcom determines the Hourly Connect usage as follows: The start time is added to the elapsed session time to calculate the stop time. The Hourly Connect usage is computed in system clock minute increments, where the start time (rounded down to the nearest whole minute) is subtracted from the stop time (rounded down to the nearest whole minute), and one minute is added to compensate for rounding.
Discounted rates apply to those portions of units in the specified ranges.
The Reconnect feature provides a period of five minutes during which elapsed connect session time following an abnormal terminal or system disconnect continues to accumulate. The Reconnect feature, which is terminable by proper disconnect, is charged at the applicable Hourly Connect, Network Communications, and Premium Product rates.

[7] Prime Hours: Monday through Friday 8:00 A.M.—5:59 P.M. EST.
Non-Prime Hours: All other hours, including weekends and national holidays.

[8] Dialcom determines Kilocharacter Traffic charges on a per connect session basis. One kilocharacter is equal to 1,000 characters (or fraction thereof). The minimum unit is one kilocharacter.

[9] Dialcom measures Network Communications usage in the same way as it measures Hourly Connect usage. The minimum communications unit for using public networks (Datapac, Telenet, and Tymnet) is three minutes. The minimum unit for using the Dialcom Direct Dial network and private networks is one minute.
Charges for certain other networks not listed above may appear on monthly invoices as PNET charges and are charged at Tymnet rates.

[10] Premiums are in addition to Hourly Connect, Kilocharacter traffic, and Network Communications charges. Unless otherwise specified, the premiums are based on an hourly rate, and the minimum connect session is four seconds.

[11] The rate for electronic mail messages sent to internationally located licensee systems is applied per message per licensee system destination. Acknowledgments of receipt from international addresses are charged at $0.50 per acknowledgment requested per international mailbox.

[12] Dialcom applies a charge for telexes and other hard copy messages and originates them from the continental United States. The changes and message rate minimums are based on International Record Carrier rates and are subject to change at any time.

[13] Use of the file transfer packages results in additional Kilocharacter Traffic and Hourly Connect premiums. Additional character transmission overhead is required for error checking and retransmission of text when errors are detected. note that the processing may result in less than maximum transmission speeds. Kilocharacter premiums are based on a per-file transaction. A kilocharacter is the minimum unit of 1,000 characters, where each fraction is charged as a full unit.

[14] When domestic NETLINK is used to gateway to non-Dialcom systems located in the continental United States, a premium of $2 per hour applies. However, if the gateway results in a collect public network call, an additional $6 per hour is incurred to cover the cost of the network call. Gateways to international systems incur the $2 per hour premium plus an additional charge for international network use.

[15] The minimum connect session is one minute.

[16] The minimum connect session is one minute. DOW JONES NEWS/RETRIEVAL Prime and Non-Prime hours are as follows:
Prime Hours: Monday through Friday 6:00 A.M.—8:59 P.M. EST.
Non-Prime Hours: All other hours, including weekends and the following holidays:
New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, and Christmas Day.

[17] Terms and conditions are covered in a Price Schedule supplement. Contract Dialcom for information.

[18] Contact Dialcom for information on Special Billing Reports.

[19] Quantity discounts are determined on a per-order basis, not on a cumulative basis.

Table 1. (Cont.)

market and commodities exchange quotations are available through the *Unistox* financial newswire, and 15-minute delayed stock quotes are available from Bunker Ramo Information Systems.

As an adjunct to its electronic news service, Dialcom offers an electronic clipping service, dubbed *News-Tab.* This service enables users to create a personal index of up to 25 key words and phrases. The program then continuously searches the newswires and automatically deposits all stories containing those key words into the user's electronic mailbox.

Federal Government News Service—actually three different database services: *FAR ONLINE*, which provides information on federal acquisitions regulations from the *Federal Register*; *FEDWIRE*, a database of verbatim transcripts from news briefings of the White House and State and Defense departments, and statements by U.S. and foreign officials; and *FEDNEWS*, which consists of press releases issued by government agencies.

Travel

Official Airline Guide—provides information on more than 820,000 direct and connecting schedules from/to more than 105,000 domestic and international locations. OAG details information on departure/arrivals, connections, type of meal service, and aircraft and fare options to or from a particular place. Full information is also available regarding special rate fares, such as "Super Savers."

EAASY SABRE—provided by American Airlines, offers access to information on domestic and international airlines, fares, and schedules; also permits users to book airline, hotel, and car reservations on a worldwide basis.

Miscellaneous

IMTS—health and medical news from the International Medical Tribune Syndicate.

Dialcom also provides access to the databases offered by *Dow Jones News/Retrieval.* These databases include current and historical stock market quotes, profiles of major U.S. companies, a stock symbol directory, a weekly economic survey, and electronic transcripts of the *Wall $treet Week* television program.

OTHER PROFESSIONAL SERVICES

Dialcom offers consulting services in systems analysis, design, and development. Dialcom's program analysts use

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a variety of languages, including Basic, Fortran, PL/1, Cobol, and Pascal.

OTHER SERVICES

Dialcom has played a key role in the development and implementation of the CCITT standards (known as X.400) for electronic mail, adopted in October 1984. The company successfully demonstrated its X.400 public system interconnection software at CeBIT '87, the world's largest telecommunications exhibition, in March 1987. Dialcom is actively marketing its X.400 Message Handling System to international PTTs and corporations interested in making a system purchase or license.

Also, Dialcom has moved its headquarters and computer facilities to Rockville, MD. It has also opened new sales offices in San Francisco and London. Dialcom reports that its expansion is positioning it to accommodate the growth it anticipates over the coming years. □

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Direct Merchandising Services, Inc.

Direct Merchandising Services, Inc. provides data processing and on-line systems support to banks, CPA firms, municipalities, park districts, direct mail advertisers, and catalog sales firms.

Their processing is geared to the needs of the mail order and direct mail industries. Direct Merchandising Services provides on-line mail order processing support (including full FTC compliance features), name and address file management, merge/purge, and label generation systems to these industries. Management and planning reports are among the features of their many packages.

COMPANY INFORMATION

Direct Merchandising Services, Inc.
400 S. Edward Street
Mt. Prospect, IL 60056
Telephone (312) 398–7845

Company Background

Direct Merchandising Services, Inc. provides batch processing and on-line services to its clients in the midwestern U.S. Specialized processing services include:

- General ledger
- Accounts payable/receivable
- A full line of banking services
- Catalog sales
- Customized systems
- Municipal accounting
- Carrier route processing
- Subscription processing
- Name and address file management
- Merge/Purge

The company's carrier route system processing enables clients to take maximum advantage of third class postage discounts by sorting labels into these categories: carrier route presort, five digit zip code, and residual.

Direct Merchandising Service's clients includes a number of mail order and direct catalog sales firms. To accommodate these firms, Direct Merchandising Services provides automated mail order processing and reporting systems. All federal regulations governing mail orders are adhered to in this processing. Its systems also provide clients with the information they need to plan promotional campaigns.

Banking systems are available for their savings and loan and banking clients. These systems can be used for the following categories of banking processing: DDA, commercial loan processing, mortgage processing, savings, installment loan processing, and customer file information processing.

Accounting packages provide accounting services to municipalities, CPA firms, and park districts.

RESOURCES AND FACILITIES

Processing Centers

Direct Merchandising Service's processing center is located in Mt. Prospect, IL, and contains the following equipment:

- IBM 4341
- Six 3370 disk drives
- Six 3330 disk drives
- Seven 1600/6250 bpi magnetic tape drives
- 3705 terminal controller
- One 3203-5 line printer
- One Xerox 1200 printer

Systems Software

OPERATING SYSTEMS: The IBM 4341 system runs IBM's DOS/POWER/VSE operating system. System software includes:

- CICS
- DFAST
- TFAST
- FAVER

UTILITIES: IBM's DOS/POWER/VSE operating system includes the full set of standard IBM utilities to perform a variety of standard services. Briefly, these utilities are:

- IEBCOPY, copies partitioned or sequential data sets
- IEBDG, generates test data
- IEBGENER, copies and edits sequential data sets
- IEBISAM, creates, copies, and unloads ISAM data sets
- IEBPTPCH, prints or punches, with editing, the content of a sequential data set or partitioned data set member
- IEBUPDTE, updates the content of a sequential data set or partitioned data set member
- IEHDASDR, analyzes, unloads, and initializes disk packs
- IEHLIST, lists, catalogs, and compresses partitioned data sets
- IEHMOVE, moves or copies sequential or partitioned data sets
- IEHPROGM, catalogs, deletes, or renames data sets
- DOS/VS Sort/Merge, sorts or merges data sets

LANGUAGES: The Direct Merchandising Services computer system supports the following programming languages:

- RPG II
- Cobol
- Assembler

▷

PROGRAMMING AIDS: The program development aids supported by Direct Merchandising Systems computer include:

- VOLLIE
- Librarian
- DyLaKor
- MFAST

Customer Support Services

Five staff members provide support services to Direct Merchandising Service's on-line and batch processing clients. Customer support includes: customized programming services; modification of existing packages; and installation, with customized modifications, of the McCormack and Dodge Financial System.

Sales and Marketing Services

Direct Merchandising Services uses a direct sales approach to sales and marketing. Typical client groups include:

- Banks
- Savings and loans
- Direct mail advertisers
- Catalog sales
- Municipalities
- Park districts
- CPA firms

APPLICATION-SPECIFIC SERVICES

Banking and Finance

On-line Banking—provides generalized banking services, including:

- DDA
- Commercial loans
- Mortgages
- Savings
- Installment loans
- Central information files

On-line Finance—provides on-line financial services processing, including:

- General ledger
- Accounts payable
- Accounts receivable
- Purchase order

Direct Mail

Order Response Processing—provides specialized services for direct mail services, including on-line order fulfillment and on-line syndication processing.

Merge/Purge—provides DMMA & House file suppression, intra and inter file dupe elimination, unrestricted selection options, and matrix analysis.

Catalog Order Processing (COPS)—provides a complete on-line catalog order processing system with the features shown in Figure 1. These features include:

- Verifying and matching orders to a customer or mailing list master file
- Editing orders
- Process charge card data
- Performing inventory relief
- Producing picking and shipping labels
- Providing status reporting
- Reporting on product file and mailing list performance
- Inventory and product file updating
- Producing cost buildup and sales/income reports
- FTC compliance

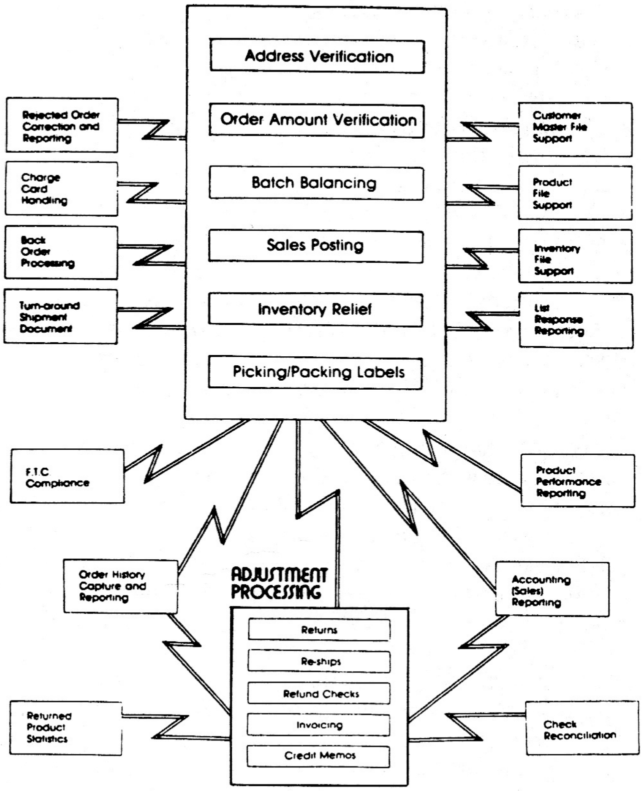
Address Verification
Order Amount Verification
Batch Balancing
Sales Posting
Inventory Relief
Picking/Packing Labels
Rejected Order Correction and Reporting
Charge Card Handling
Back Order Processing
Turn-around Shipment Document
Customer Master File Support
Product File Support
Inventory File Support
List Response Reporting
F.T.C Compliance
Product Performance Reporting
Order History Capture and Reporting
ADJUSTMENT PROCESSING
Accounting (Sales) Reporting
Returns
Re-ships
Refund Checks
Invoicing
Credit Memos
Returned Product Statistics
Check Reconciliation

Figure 1. Catalog order processing system

Carrier Route Presort & Label Generation—provides direct mail services, including selected label generation and label sorting by post office carrier route designations.

Name and Address Management—provides list maintenance, label generation, and statistical analyses for name and address data for a variety of applications, including direct mail services and catalog sales services.

NETWORKING SERVICES

The IBM 4341 host computer accepts Bisynch, Asynch, and EBCDIC codes and protocols for 3270-type terminals. Transmission speeds include 2400, 4800, and 9600 baud.

Direct Merchandising Services, Inc.

▷ ON-LINE DATABASES

Direct Merchandising Services supports no public on-line databases, although its clients' databases are on-line and available for processing.

OTHER PROFESSIONAL SERVICES

In addition to providing their clients with on-line and batch processing computer resources, Direct Merchandising Services provides customized programming services.

FUTURE PLANS

Direct Merchandising Services, Inc. plans to increase their on-line network capabilities to provide more facilities to its clients. The company will also feature a new subscription management system that will include these functions:

- Receiving and opening mail
- Cashiering functions such as depositing payments and reconciliation
- Data entry
- File maintenance
- Label generation
- Correspondence
- Sales analysis reports showing source media, age, sex, location, and combination reports
- Renewal analysis reports
- Forecasts of renewals and magazine requirements ☐

Endata Inc.

Endata Inc., established in 1969, provides data processing and general computer services to approximately 3,000 clients. Formerly called NLT Computer Services Company, Endata caters to the wholesale distributors of industrial supplies and beverages. In addition, the company provides on-line computing services and turnkey systems. The company also offers applications in accounting, distribution, and fund-raising.

COMPANY INFORMATION

Endata Inc.
50 Vantage Way
Nashville, TN 37228
Telephone (615) 244-0244

Company Background

Endata Inc., headquartered in Nashville, TN, became a public company in March 1983. Formerly named NLT Computer Services Co., Endata was established in 1969 as a local data processing firm. Today, it provides data processing and general computer services to approximately 3,000 clients through data centers located in Nashville, TN and Philadelphia, PA.

Endata Inc. caters to the distribution industry and boasts of more years of service to distributors than any other company. The company's primary customers are wholesale distributors of industrial supplies and beverages. Endata provides interactive computing services accessed via small computer terminals located at the user site, and offers distribution accounting software. Endata also sells turnkey systems that can be ordered using a basic on-line terminal or built as a complete data processing system with proprietary, industry-intensive software.

Competitive Position

Endata Inc. has experienced continuous growth, and today, according to the company, is ranked among the top U.S. computer services companies, competing with Automatic Data Processing, Inc. (ADP), ASK Computer Systems, and Boeing Computer Services Company.

An average annual revenue growth rate of more than 30 percent during the past eight years has been attained by Endata Inc.

Customer support has been one of the reasons for Endata's success. An Endata representative is assigned to each account and is backed by a team of system and application specialists knowledgeable in distribution practices and procedures. An on-site installation team assumes total responsibility for training the client's office staff. Endata provides on-going software support, enhancement programs, and operations support of its hardware.

RESOURCES AND FACILITIES

Processing Centers

Endata Inc. operates data centers in Nashville, TN and Philadelphia, PA.

Customer Support Services

Endata's extensive support services include the following:

- *Software Support Program*—an on-going software maintenance and enhancement program supported by the staff of programmers and system analysts who created the package. The program provides:
  - A warranty against programming errors
  - An on-going enhancement program
  - Technical support to meet specific needs
  - Toll-free phone assistance
  - A client-guided advisory board

- *On-Site Support Program*—a consulting and installation service involving service representatives.

- *Installation and Conversion*—provides services for:
  - File development strategies
  - Training programs
  - Forms design assistance
  - Testing and installation of hardware
  - Proven conversion techniques
  - Complete documentation
  - Office procedure recommendations

- *Consultation*—a service that:
  - Formulates inventory control policies
  - Develops turn and earn pricing policies
  - Conducts on-site seminars for employees
  - Reviews new application requirements
  - Organizes user meetings and seminars

- *Toll-free Phone Support*—provides users with answers to questions concerning:
  - Day-to-day procedures
  - Data entry
  - File integrity problems
  - Consultation

Endata provides the Distribution Manager with the following:

- Day-end report processing
- Daily file backup
- Month-end report processing
- Paper, disks, tape, ribbons, supplies
- I/O control and balancing of all files
- Year-end processing
- System restart and file recovery

All users receive the following:

- Toll-free phone support
- Hardware diagnostic service
- Communications diagnostic service
- System backup for emergencies
- System backup for large print jobs
- Complete operations documentation

Typical Customer Profile

Interstate Electric Supply Co., of Fairfax, VA, has been using Endata's distributor services for 10 years. The wholesale electric supply distributor uses a variety of services, including management of accounts payable, accounts receivable, and inventory control. Interstate claims that the best aspect of Endata's service is its ability to relate to the company's distribution business.

Sales and Marketing Services

Endata Inc. provides nationwide coverage from its sales office locations in Philadelphia, PA; St. Louis, MO; Dallas, TX; New York, NY; Charlotte, NC; and Nashville, TN.

APPLICATION-SPECIFIC SERVICES

Accounting

Standard Accounting System—designed to meet the needs of a wide variety of businesses and provide many options to meet specific requirements. It provides payroll, accounts payable, accounts receivable, and general ledger services.

Fund Raising

Endata operates its Direct Response Group from its Tennessee office and provides services needed by clients for direct-response fund raising, from writing letters and designing other materials, to developing and maintaining mailing lists, and addressing and mailing letters.

Donor (Donor Oriented Nonprofit Organization Record-Keeping System)—provides automated record-keeping and follow-up services for direct-response fund raising.

INDUSTRY-SPECIFIC SERVICES

Distribution

The Distribution Manager (TDM)—offers a family of upward-expandable hardware systems designed specifically to meet the distributor's information needs. A full set of software is provided to operate and extend the system.

TDM, for distributors, utilizes minicomputers at the distributor's facility and/or large scale computer systems at the Endata center in various combinations.

Terminal Systems are connected via an interactive communications network to the Endata data centers, where Endata professionals assume primary responsibility for operation of the system.

Endata also offers standalone systems with the distributor, responsible for all daily and monthly processing, and the Endata data centers are available for supplemental services. These are available with Data General or IBM Computers.

The software has been designed exclusively for wholesale distributors. Every applications program includes dozens of options allowing the user to customize the system by selecting the report formats and processing options that meet his/her specific needs. All or any part of the applications software library can be used and applications added. The same software is used with all models, whether connected to the Endata communications network, or on an inhouse system.

Endata software features an interactive, multitasking operating system. Currently, 32 video terminals can have simultaneous access to the system.

The applications library includes:

- Billing and accounts receivable
- Pricing
- Accounts payable
- General ledger
- Payroll
- Inventory control and management
- Order entry
- Open order processing
- System selling
- Sales reporting

The software has been designed to interface with any of the automated pricing services such as:

- Direct mail services
- Remote job entry
- Text editing and word processing
- Facilities management

Target—is a beverage distributor management system designed exclusively for the beverage wholesalers. Users select equipment from a series of video display and printer terminals for their facilities including remote batch locations. Data processing is performed by Endata's computers. Target includes the following packages:

- *Billing*—provides preparation of invoices and memos, automatic posting of accounts receivable, sales history and inventory, back-order exception notices, posting of cash entries and adjustments, sales and cash journals, credit limit exception reports, on-line inquiry of up-to-the-minute accounts, monthly customer statements and ledgers, aged trial balance, customer master listing or labels, credit management report, and state tax reporting.

- *Inventory Control and Management*—stores 15 months' case movement history for each inventory item on-line, allowing inventory exception reporting daily, weekly, or monthly. In addition, it provides inventory sales projections, overstocked reports, supplies depletion reporting, weekly depletion reporting, and state-level reporting. The package also produces an inventory projection analysis, a key purchasing report that automatically prepares an analysis of an individual vendor's line, and produces a list of items that have reached the reorder level.

- *Sales Reporting*—provides gross sales and margin reports, current and year-to-date amounts, previous year comparisons, and sales and margins information by any combination of customer, salesman, or product.
- *Accounts Payable*—provides vendor file maintenance, posting of charges and credits, check register and check printing, cash forecast journal, and account payable open item list. A standalone version of this software is available on the IBM 34/36 computer series.

NETWORKING SERVICES

Endata's interactive computing services are accessed via dial-up telephone from Video Display Terminals (VDTs) or computer systems located at user sites.

OTHER PROFESSIONAL SERVICES

Endata's Micrographics Division provides computer output microfilm services to clients from several locations. The company believes microfiche is an efficient and economical way to store historical data or produce multiple copies. In many cases, Endata feels it can provide microfiche at a lower cost than paper.

FUTURE PLANS

Endata has dedicated its future plans to providing better products to its customers. ☐

IBM Information Network (IBM IN)

COMPANY INFORMATION

IBM Information Network (IBM IN)
P.O. Box 30021
Tampa, FL 33630-3104
Telephone (813) 872-3000

Company Background

When the IBM Information Network (IBM IN) debuted in 1982, it focused only on remote computing services. Industry analysts and competitors alike termed its original offering tame. When the company introduced its Network Services products in September 1982, the network's complexion began to change as its role was expanded to include network management. Thus, customers could link their own dispersed computers and terminals using the IBM network. Multilocation organizations no longer had to create networks of their own. Customers only had to concern themselves with communications to and from the access cities.

International Business Machines Corporation regards IBM IN as an independent business unit. IBM IN's organizational structure includes the following functions: Development, Operations, Marketing, Plans and Controls, and Counsel. Although the network is a separate entity, it works closely with the parent company's marketing departments and complements IBM's hardware and software products. In addition to linking their remote locations with a central processor, IBM IN permits users to develop and test software packages, to store and retrieve data, and to access the network's program products.

IBM IN provides several value-added services. Among these are Information Exchange, where certain networking products employ an electronic mailbox concept that allows customers to send messages to the network where they are held until addresses call for them; Electronic Data Interchange (EDI) Services, an IBM message service that supports industry codes for data handling; Electronic Support Facility, a service that links companies and their customers through the Information Network and permits the companies to supply consumers with product-related information through the customer's personal computers; and Intercontinental Information Services, which provides links between the Information Network and the IBM computer center in Europe.

Two types of access nodes exist for the Information network. Primary nodes can accommodate all host and terminal attachments supported by the network. These include Systems Network Architecture (SNA) terminals transmitting over leased or dial facilities, BSC 3270 devices or emulators through dial lines, asynchronous terminals via dial lines, and SNA host computer attachments using leased lines.

A major supplier of remote computing as well as enhanced services (including information retrieval), the IBM Information Network (IBM IN) was established in 1982. Information Network offerings include networking products that enable customers to link host computers and terminals to the network for communicating with devices in other locations; remote computing products that allow customers to use programs on the network; and information services that provide access to databases and software, many of which have been produced and are maintained by other companies.

IBM IN's remote computing services products are available under the VM or MVS environments. Application System (AS) is one such product. Each facility provides access to specified IBM systems and applications program products (including more than 200 software packages for data management and program development). The network can be accessed through switched- or leased-line connections.

IBM's Network Services products enable customers to link geographically dispersed computers and terminals, using IBM as their network. Network Services provides alternate paths within the network, thus increasing its reliability. It also provides multiple parallel links so that host processors can be linked to the network through more than one line.

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Customers can directly access the network from 18 cities, which are interconnected via communications processors to the data center in Tampa, FL. The primary cities are:

- Atlanta, GA
- Boston, MA
- Chicago, IL
- Dallas, TX
- Denver, CO
- Detroit, MI
- Houston, TX
- Los Angeles, CA
- Miami, FL
- Minneapolis, MN
- New York, NY

▷

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- Philadelphia, PA
- Raleigh, NC
- San Francisco, CA
- Seattle, WA
- St. Louis, MO
- Tampa, FL
- Washington, DC

In addition, IBM expanded IBM IN into 100 additional cities. Thus, local access to IBM IN is now available from 226 announced cities. IBM IN can be accessed from an additional 370 cities through a secondary network (Telenet) that uses asynchronous, dial-up terminals. The primary network is accessible using switched or nonswitched (leased-line) facilities.

IBM IN also offers IBM Intercontinental Information Services, whereby customers of the network, INS-Europe, Middle East, Asia, and Japan can access interactive TSO and Batch MVS services running on the INS-EMEA computer center in Zoetermeer, The Netherlands. Subsidiaries of customers attached to the Dutch, French, and United Kingdom Postal, Telegraph, and Telephone services can also access these services in Zoetermeer. These customers can also use the IBM International Business Services (IBS) Data Transfer Service (IDTS) for data transfer between various locations in the customer's multinational enterprise. The international link can be used for financial reporting, allowing companies with foreign subsidiaries to get reports directly to host processors from overseas operations. In addition to providing links to major cities in Western Europe, the Intercontinental Service supports X.25 line service to 37 other countries.

IBM IN's services consist of networking, remote computing, and information. Networking services include Network Services, Information Exchange, Electronic Data Interchange Services, Electronic Support Facility, Insurance Communication Service, and IBM Intercontinental Information Services. Remote computing services offer more than 200 software products for data management and program development. Information Services comprises data banks and various software facilities provided by IBM and other companies, including *DB-View*, which provides access to the *Compustat*, *Worldscope*, *Tradeline*, and *I/B/E/S* databases; Marketing Support Systems; and various other interactive on-line databases.

RESOURCES AND FACILITIES

Processing Center

IBM IN is headquartered in Tampa, Florida and operates data centers in Tampa; Cary, North Carolina; and Irving, Texas. The computing centers use IBM 30XX mainframe computers. The central processors share I/O equipment and provide backup for one another. Alternate communications routes and an uninterruptible power supply are provided to assure continuity of service.

Systems Software

The Information Network enables an organization's programmers to access either of two development environments from their own workstations and to access system editors, compilers, high-level languages, debugging tools, conversion aids, database management systems, databanks, text processors, and interactive, terminal-based education systems. The network, in either environment, provides access to on-line facilities suitable for a broad range of project development tasks and has the sufficient capacity, fast responsiveness, and separate test resources necessary to eliminate off-shift testing and debugging.

Multiple Virtual Storage Productivity System (MVSPS)

OPERATING SYSTEM: Multiple Virtual Storage (MVS) is the virtual storage operating system designed to perform the system control function in large environments. It is designed to provide unrestricted multiprogramming and is often selected as the primary operating system for support of batch and data systems operation.

The following programs operate with MVS to control the network's resources for its users.

JES2—a standard job entry subsystem of MVS. Operating in a separate address space, JES2 is responsible for initializing and controlling TSO batch job submission and controlling output for printing and routing.

Network Job Entry Facility for JES2—arranges transmission of selected jobs and in-stream data sets, job-oriented operator commands and messages, and job accounting information from one node to another.

Advanced Communications Function/Virtual Telecommunications Access Method (ACF/VTAM)—the base for major IBM communications subsystems, providing operating system functions for the network just as the operating system controls resources for the CPU.

Sequential Access Method Extended—provides for accessing data from tape storage media.

Network Communication Control Facility (NCCF)—a supplement to ACF/VTAM, assists the operator by automating various operational procedures. In the network environment, NCCF systems are interconnected to provide integrity for the network management as well as automation of the fallback procedures.

Data Facility/Data Set Services—provides protection and recovery of information stored on disk and mass storage devices.

The Hierarchical Storage Manager—organizes the storage options considering costs, capacities, and access attributes. It maintains more active data on faster access devices and less active information on cheaper devices. Mass Storage

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System Extensions manages data stored in the 3850 Mass Storage System, helps back up data from virtual volumes, and provides a journal of all user-selected Mass Storage messages.

Resource Measurement Facility—a centralized measurement tool that monitors system activity for performance and capacity planning data.

Resource Access Control Facility—provides a comprehensive access control system for the MVS system environment, managing user access to system resources. It identifies users, checks access authorization, logs and reports access events, and has commands and utilities for administrative purposes.

Interactive users of MVSPS access network facilities through the Time Sharing Option (TSO), a system that provides interactive computing in the large-system environment. Each TSO user has the full facility of MVS and a separate address space. *TSO Session Manager* provides full-screen support for non-full-screen applications.

PROGRAM DEVELOPMENT AIDS: Under the MVS and TSO facilities are an array of application development facilities, including the traditional languages and advanced aids especially useful in the interactive environment.

Interactive System Productivity Feature—operates under TSO and aids the programmer in several ways. Incorporating structured programming functions, it has facilities for displaying predefined screen images, building and maintaining permanent tables of user information, and generating output files for job submittal or other processing. Using ISPF dialogs and MVSPS extensions, a programmer can sit at a terminal; work through selection menus; call up desired functions; check into a tutorial as needed; use PF keys for defined functions; scroll forward, backward, and sideways through source data or listings; and enter changes into a full screen that are then entered all at one time.

Document Composition Facility (DCF)—helps users write, edit, maintain, and retrieve text. For the programmer and systems designer, this includes code and documentation. DCF consists of a formatter called SCRIPT/VS and a foreground environment feature that allows for interactive use. A sophisticated system that checks spelling, DCF allows the user to format full pages, arrange multiple columns, handle variable indentations, and automate heading and footing notations.

OS/VS2 Sort/Merge is provided to sort blocked or unblocked sequential data sets containing fixed- or variable-length records.

MVSPS also includes a number of programming aids to help users develop *Information Management System* applications in which they access computer-maintained databases from remote locations, via terminals.

Application Development Facility (ADF)—an application generation and maintenance system, under IMS Database, that substantially reduces the effort required to develop and maintain IMS applications. ADF consists of skeletal IMS/VS application programs, databases, and additional modules of code and data.

Batch Terminal Simulator (BTS)—allows on-line testing of IMS application programs from batch or TSO in lieu of testing with a full IMS DC environment. BTS supplies information about each transaction or message as it progresses through the IMS application. It provides IMS users with ways to check and debug the application program logic, the IMS interfaces, teleprocessing activity, 3270 format control blocks, and database activity.

The DB/DC Data Dictionary—a single source of descriptive data about files, databases, programs, user-defined resources, and their relationship to one another. Data Dictionary is available under BTS for testing interactively.

DP PROTOTYPE II—a set of programs providing database design evaluation of IMS applications, so the user can obtain performance information about a database and its application programs before they are implemented.

IMS MAP—a program used to produce printed images of physical and logical databases as they exist in the IMS libraries. Both the physical and logical hierarchical structures are depicted.

IMS Space Management Utilities—a set of programs designed to detect and report Hierarchical Direct pointer discrepancies, to provide statistics and information for hierarchical direct tuning, and to assist with segment restructuring and reloading during database reorganization.

DATA MANAGEMENT: Database 2 (DB2), IBM's relational database management system program product, is designed for the MVS/XA and MVS/370 environments. It can coexist with and complement Information Management System/Virtual Storage Version 2 Data Base System in these environments. DB2 supports a relational data model. A DB2 database can be viewed as a collection of tables. Data is defined in terms of tables and accessed through operations on tables. Data definition, retrieval, manipulation, and control operations are supported by the Structured Query Language (SQL).

LANGUAGES: Programming languages and conversion aids available under MVSPS include the following:

- OS Assembler
- TSO Assembler Prompter
- OS/VS Cobol Compiler
- TSO Cobol Prompter
- Cobol Interactive Debug
- VS Fortran
- OS Fortran IV Compiler
- Fortran Interactive Debug
- OS Fortran Library

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TYPE	MVS Productivity System (MVSPS)	
	Prime time ($)	Non-prime time ($)
Interactive	0.49 per CRU MVS	0.24 per CRU MVS
Background	0.37 per CRU MVS	0.24 per CRU MVS
CICS Address Space	0.49 per CRU	0.24 per CRU

TYPE	VM Productivity System (VMPS)	
	Prime time ($)	Non-prime time ($)
Interactive	VM: 0.43 per CRU AS: 0.68 per CRU	VM: 0.24 per CRU AS: 0.33 per CRU

Table 1. Monthly processing charges.

- Code-and-Go Fortran
- TSO Fortran Prompter
- PL/1 Checkout Compiler
- PL/1 Optimizing Compiler

Virtual Machine Productivity System (VMPS)

OPERATING SYSTEM: The second environment data processing professionals can select for development work on the network is the Virtual Machine Productivity System (VMPS), employing IBM's Virtual Machine/System Product (VM/SP). VM/SP provides the user with the computing resources functionally equivalent to a full computer system (virtual machine).

Control Program (CP)—manages the real computing system so that the processor, storage, and input/output resources are available to many concurrent users. Each user is given a virtual machine in which a customized environment is established. The CP allows many virtual machines to run concurrently, yet independently.

Conversational Monitor System (CMS)—the system program element that controls the interactive processing for VM users. CMS is a powerful system that aids developers with source program maintenance, compiling and executing of programs, and interfaces with major languages. CMS commands allow the user to invoke useful routines, programs, and languages that are resident in VM/SP or that interface with the operating system.

Remote Spooling Communication Subsystem—transfers unit record files between virtual machines and remote stations that are connected through BSC switched or nonswitched lines.

Resource Access Control Facility—provides a comprehensive access control system for the VMPS environment, managing user access to system resources. It identifies and verifies users, checks access authorization logs, reports access events, and has commands and utilities for administrative purposes.

PROGRAM DEVELOPMENT AIDS: VMPS permits developers to create source data sets using one of two editors to compile source data sets using various compilers and to

Type	AS	MVSPS	VMPS
Nondedicated Direct Access Storage (DASD)	Utilized: $3.73 per megabyte per day**	$2.48 per megabyte per day**	$2.48 per megabyte per day**
	Allocated: $2.48 per megabyte per day**		
Mass Storage	0.09 per megabyte per day	0.09 per megabyte per day	0.09 per megabyte per day
Online Disk Facility	Not available	Not available	0.002 per megabyte per minute and 0.01 minimum per month

*** Eligible for DASD allowance.*

Table 2. Storage charges.

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Installation charges include the planning and testing for the customer network or customer NETID connection.

A network connection can support a single customer host or multiple customer hosts. A network may or may not have terminals attached which are defined to the Information Network. Multiple Information Network connections to different IBM IN gateways by the same customer SNA/MSNF network identification do incur additional connection installation charges. Additional NETIDs requiring definition for a single customer network are considered additional and will be charged accordingly. A transmission group is considered one connection for the purpose of installation charges.

The Installation charge for the BSC Emulation interface applies to each connection to a customer host.

Installation charges	SNA/MSNF ($)	BSC Emulation ($)
First connection	1,242.00 per connection	373 per connection
Additional connections (same network interface)	621.00 per connection	Not applicable
Attached network resource registration	32.30 per device	Not applicable
Recertification testing	373.00 per test hour	Not applicable

Recertification charges are incurred to reestablish connection to the Information Network after a customer-implemented change that affects the interface. Recertification is performed at the customer's request.

Table 3. Network Services' schedule of charges.

link-edit object modules quickly and efficiently. Multiple environments are provided for controlling the production and testing of new program elements.

VMPS users have two paths to the processing facilities in their virtual machines. Users can proceed by invoking CMS commands, or they can take advantage of the VMPS dialogs that prompt users for information in menus and data entry panels. The dialogs make it easy to invoke products and their various functions. The VMPS facilities provide the programmer two applications development options: Operating System (CMS/OS for interactive, MVSPS for batch) and the Conversational Monitor System.

To support development within these areas, VMPS includes the following system facilities:

Interactive System Productivity Facility (SPF)—the VM full-screen editor that is intended to be the primary editor for the CMS user. If CMS is used primarily for program development, SPF is recommended. SPF is also recommended for installations requiring compatible editors in a mixed TSO-CMS environment. SPF consists of a dialog manager that provides services for running interactive applications and the program development facilities that provide for libraries, full-screen editing, scrolling, and document preparation support.

Cobol/Structuring Facility (SF)—designed to turn unstructured VS Cobol III programs into structured programs. The objective of Cobol/SF is to help make program maintenance and evolution more systematic and manageable by transforming programs into forms that are easier to read and understand.

Document Composition Facility—available in VMPS to support text processing.

DATA MANAGEMENT: VMPS facilities for managing data include the following:

Structured Query Language/Data System (SQL/DS)—a relational database management system designed for both end users and data processing professionals. SQL/DS provides facilities for creating databases, copying data, formatting reports, and manipulating data. It also contains data recovery and security facilities. The language used for handling the data, Structured Query Language (SQL), can be entered from a terminal, used as utility program input, or embedded in a program written in Cobol, PL/1, APL2, Fortran, or Assembler.

Query Management Facility (QMF)—provides interactive database facilities to users with little or no data processing experience. It can also be highly useful to the data processing professional as a productivity tool for use in application development and prototyping.

QMF provides:

- Both SQL and Query by Example (QBE) data manipulation
- Data Definition functions through SQL Language
- Easy-to-specify interactive reports definition and generation

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- A simple set of commands for handling queries, data, reports, and procedures
- An application that can invoke the Interactive Chart Utility (ICU) of the Graphical Data Display Manager (GDDM) to present data prepared by QMF

QMF users should be able to produce meaningful results with only a portion of the SQL or QBE language facility and/or QMF commands. To make QMF easier to use, a set of Help panels and prompted SQL queries are provided.

Data Base Edit Facility (DBEDIT)—panels provide full-screen data retrieval, update, insert, and delete capabilities. It provides users with a simple way to define their own end-user panels.

Structured Query Language/Edit (SQLE)—provides full-screen entry and update of information in SQL/DS tables. Data entry screen can be built by responding to a few simple questions.

LANGUAGES: Programming languages and related facilities under VMPS include the following:

- OS Assembler H
- Assembler H/CMS Interface
- OS Fortran IV (H Extended) Compiler
- Fortran H Extended Optimization Enhancements
- Fortran Interactive Subroutine Library
- Fortran Interactive Debug
- VS Fortran Compiler and Library
- OS PL/1 Checkout Compiler
- OS PL/1 Optimizing Compiler and Libraries
- OS/VS Cobol Compiler and Library
- Cobol Interactive Debug
- Pascal/VS
- LISP/VM
- VS Cobol II

Customer Support Services

IBM IN's customer assistance personnel answer questions posed by users working with a variety of designated programs. Should clients require help with other programs, customer assistance links them with an appropriate IBM marketing representative or systems engineer.

IBM IN also offers several types of training. The IBM Education Center in Tampa offers classroom courses. Self-study education is available in three basic formats: Independent Study Programs (ISP), Student Texts, and Programmed Instruction (PI) Texts. On-line education is delivered through IBM IN, including the Help function and selected tutorials.

Sales and Marketing Services

IBM IN marketing representatives are responsible for coordinating account activity, planning for the installation with the user, and handling the details of ongoing activities. Sales and marketing offices are located in major cities across the country.

PROCESSING SERVICES

Pricing Information

Prices for IBM IN facilities are based on usage added to a minimum monthly charge of $40 per activity base. Additional costs are based on the computing and network resources used and disk storage charges.

Table 1 (Page RC20-464-104) shows the monthly processing charges applied to IBM IN products under the MVS Productivity System (MVSPS) and the VM Productivity System (VMPS). Table 2 (Page RC20-464-104) features IBM IN's storage charges.

Table 3 (Page RC20-464-105) is a schedule of Network Services' nonrecurring charges. Network Services consists of access to IBM IN facilities, programming, machines, and assistance to accommodate interconnection of customer terminals and host computers.

Contract Terms and Conditions

The IBM IN Agreement covers all customer on-line access to and use of IBM data processing and networking facilities, including all associated communications and support services. For each IBM IN product, IBM provides a Supplement and/or Schedule of Charges, containing applicable terms and conditions.

The charges, terms, and conditions of the IBM IN Agreement are subject to change by IBM upon one month's written notice. Invoices, rendered monthly, are payable upon receipt. If not paid within 30 days, IBM may, at its discretion, terminate the agreement and customer access to IBM IN products. The agreement can be terminated by either party on 30-day notification.

APPLICATION-SPECIFIC SERVICES

The *Application System (AS)* is an IBM IN product designed to enable business professionals to manipulate and examine data flexibly. AS allows the user to solve problems interactively and analyze information using English-language commands. AS is offered under IBM IN's Virtual Machine Productivity System.

AS consists of subsystems that encompass a wide range of facilities, including the following:

- *DATA*—allows for entry of new data records and the listing, changing, and deleting of existing records.

- *EDIT*—allows data checking and validation procedures to be applied to each record on an existing data file or to new records as they are entered.

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> - *UPDATE*—provides facilities for updating one file with the contents of another.

- *PROCEDURE*—allows definition of a set of AS commands for later execution with a single command.

- *REPORT*—enables definition and generation of tailored reports from data file information. A conversational report facility that formats reports based on the responses of a few questions is also available.

- *GRAPH*—provides a comprehensive set of facilities for producing line plots and histograms.

- *TABULATE*—allows creation of summary reports based on the information in the data files.

- *MODEL*—designed for the specifications and production of company models and financial plans.

- *COMPOSE*—provides text processing facilities for letters, memos, publications, and reports.

- *PROJECT CONTROL*—provides facilities such as analysis, network drawing, free float, and daily work patterns, in addition to multiple calendars and most other standard project control features.

- *STATISTICS* and *FORECASTING*—include integrated graphics for curve fitting and linear trend analysis, in addition to significance levels in statistical tests and most other standard statistical capabilities.

The AS subsystems are designed as an integrated information processing system.

Electronic Office

The IBM *Professional Office System (PROFS)* is an administrative support system designed for managers and other professionals and their administrative and clerical staffs. IBM IN hastens the start-up of the PROFS system with a variety of terminals while making it possible to use the system at several locations so that the electronic transmission of messages can be implemented. In other words, the user can use PROFS quickly while on the network and can also use the network to link locations for electronic mail. The network also provides training and toll-free customer service. PROFS offers the following capabilities:

- Send/receive mail electronically.

- Enter, edit, proofread, and file documents.

- Search and retrieve documents.

- Update and check calendars.

- Schedule meetings and physical facilities.

Expert System Environment/VM

Expert System Environment/VM provides the tools necessary to develop, maintain, and execute an expert system. It is composed of two complementary IBM program offerings, *Expert System Development Environment/VM*—used to "build" knowledge bases—and *Expert System Consultation Environment*/VM—used to "consult" those knowledge bases.

The two components of the Expert System Environment/VM include the following features:

- English-like rules
- Specialized edits with automatic checking to facilitate the entry and modification of knowledge-based objects
- Explanation during consultation: "Why" provides a logical explanation for a certain request. "What" provides a more detailed explanation of the question being asked
- Debugging support
- Two interface processes: forward chaining and backward chaining
- On-line help

Report Generation/Graphics

Info Center *1*, a licensed program available on the Information Network, provides an integrated, unified, multifunction information center environment compatible with IBM IN predecessor products. Info Center 1 offers business professionals the following functions through a full-screen interface with prompts and an extensive Help facility:

- Data inquiry and analysis.

- Casual and formal report formatting.

- Data entry and validation.

- A broad complement of business and financial planning functions.

- Business graphics.

Info Center 1 incorporates and extends the functions of the following products previously offered by the Information Center: *A Departmental Reporting System II*, including the *Business Graphics* feature; *APL Data Interface II*; and *The Financial Planning System II.*

The *Graphical Data Display Manager (GDDM)*, with the presentation graphics feature, can be used to create charts from programs written in Cobol, Fortran, PL/1, VS APL, and Assembler. (Prior coding experience with these languages is necessary.) It includes the *Interactive Chart Utility*, which may be used to construct graphs and charts without requiring proficiency in any of these languages.

GRAPHPAK Full Screen Interface (APLGI or GRAPHPAK FSI) is an interactive, full-screen-oriented, menu- ▷

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driven facility that allows both nonprogrammers and programmers to use the wide range of graphics capabilities VS APL GRAPHPAK provides. GRAPHPAK provides a variety of facilities allowing the user to create charts, graphs, and diagrams.

Text Processing

Document Composition Facility (DCF or SCRIPT/VS) formats text for printing on terminals, impact printers, or nonimpact printers. It provides flexible composition for printing on a computer printer as an alternative to independent typesetting. SCRIPT/VS can also be used to prepare documents for processing by other programs that support photocomposers as well as for input to STAIRS/VS.

Storage and Information Retrieval System (STAIRS/VS) is a multiuser system for the storage and retrieval of documents. It offers the user a variety of resources to create and maintain databases and, especially, to retrieve and output documents. Users retrieve documents by means of queries that they formulate in extended Boolean logic and comparison operators.

Statistical Analysis/Planning/Modeling

Statistical Library I and II contains APL functions for computations in statistical analysis and linear programming. The statistical analyses include descriptive statistics, hypothesis testing, confidence intervals, analysis of variance, regression analysis, quality control, reliability analysis, inferential analysis, correlation analysis, and nonlinear least squares. The APL Advanced Statistical Library (STATLIB II) extends the routines available, including topics selected from multivariate analysis, time-series analysis, and nonparametric statistics.

Multivariate Time Series Analysis (MTSA) is based upon the Box-Jenkins time-series analysis techniques. MTSA accommodates scalar and vector systems, transfer models, and open- and closed-loop systems.

Continuous System Modeling Program (CSMP) is a hybrid digital continuous simulator that combines the fully interactive properties of APL with the simulation of continuous process. CSMP allows models to be prepared from either a block diagram or a set of ordinary differential equations.

General Purpose Simulation System (GPSS) is a tool for modeling and examining the behavior of systems in the engineering and management sciences environments. Varying environments with GPSS can identify optimal conditions, isolate bottlenecks, and determine the effects of delays caused by capacity limitations.

Education

APL Computer-Aided Instruction consists of 47 "minilessons" sequenced by topic complexity in an instruction and question format.

The *Interactive Instructional Presentation System* allows users to present computer-based training courses to students. Included are functions necessary to administer the training application. The system is a prerequisite for its companion product, the Interactive Instructional Authoring System.

NETWORK ARCHITECTURE

IBM IN integrates advanced computers, programs, and telecommunications technology. Its design incorporates disciplines for analyzing performance and availability and for managing distributed processing.

The network has been implemented under a concept called Communication Management Configuration, by which separate processors are dedicated to application processing and to controlling user access and monitoring performance. Known as the CMC processor, the latter employs a teleprocessing access method to control the network and thereby isolates network management from application processing. This concept helps separate the development responsibilities and provides an opportunity to optimize and expand the network as distinct from application processing.

Controllers in the network are IBM 3725 units running under the Network Control Program. The controllers are arranged in a two-tiered configuration. One tier services the application processors. The second tier serves the CMC and provides the link to the remote 3725 controllers that have the boundary function of the Network Control Program.

Most IBM systems compatible with System/370 can be attached through one of the Network Services' host interfaces. Host systems can be attached to the network node via the SNA/MSNF host interface if they run under DOS/VSE with VTAM and MSNF, or with VTAME; MVS with VTAM and MSNF; or VM/SP with VCNA and DOS/VSE. Processors attached in this way can communicate with any supported devices.

There are no specific subsystem requirements. Customers are required to meet certain release requirements on VTAM and NCP, but are able to use any subsystem supported by the network's VTAM/NCP configuration. Consequently, such subsystems as TSO, JES2, and VSPC can run in a customer's processor attached to a network node and can participate as a full SNA/MSNF Network Services processor.

Most System/370-like systems that support leased-line BSC 3270s are attached to the network node in Tampa via the BSC 3270 emulation interface. This interface makes the network look like a BSC 3271 cluster controller to the customer's processor. Only 3270-like terminals can communicate with processors attached in this way.

The software that connects a customer's processor to the network in this environment emulates the BSC 3271 pro-

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tocol. Applications that require 3270 features, such as color graphics or certain special characters, cannot operate in these environments.

Terminal or control units attached to IBM IN via analog lines are supported at speeds of 2400, 4800, or 9600 bps.

IBM IN has announced the planned availability of Connectivity Service (CS) and withdrawal of Extended Network Attachment and the dedicated leased-line port options for 1988. The CS Options for attaching leased lines to IBM IN are Enhanced, Standard, and Alternate. With the Enhanced Option, IBM IN orders, installs, owns, and manages the leased line from the IBM IN node to the customer's premises and provides the dedicated leased-line port on the Information Network Communications Controller and associated modems or DSUs/CSUs. With the Standard Option, the conditions are the same as the Enhanced Option except the customer must provide the modems or DSUs/CSUs. For the Alternate Option, IBM IN provides the dedicated leased-line port on the Information Network Communications Controller. The customer must provide the modems or DSUs/CSUs, as well as owning, ordering, installing, and managing the leased line.

In addition to analog lines, CS supports digital (DDS) lines where offered by common carriers. The Enhanced and Standard Options support point-to-point and multipoint lines with a maximum of four physical drops on a multipoint line. The Alternate Option allows point-to-point and multipoint lines. IBM IN recommends that no more than four physical drops be on a single multipoint line. Attachment using a fanout modem is supported. This allows attachment of multiple control units and/or terminal devices to a single analog line using a modem with the fanout feature. Up to three control units can be attached to IBM modems with this feature. The additional control units on a fanout modem do not incur Connectivity Service charges as subsequent points on a multipoint line. Table 4 (Page RC20-464-111) shows monthly Connectivity Service charges.

Network Services

Network Services is a product of IBM IN that provides interactive networking. Customers using this product can attach their SNA networks to the Information Network, as well as terminals and computers. Support for attached SNA networks allows terminals in an attached network to communicate with applications in other attached networks and attached host processors.

Individual SNA networks or sets of several SNA networks can be attached to IBM IN using SNA Network Interconnection (SNI). The SNI facility allows users and application programs in one SNA network to access authorized information and application programs in other SNA networks. IBM IN supports attachment of customer cascaded networks or serial configurations, consisting of three or more SNA networks in series. IBM IN also supports attachment of HUB null network configurations with three or more SNA networks connected to a common null network.

Network Services now provides alternate paths within the network to increase its reliability. It also provides multiple parallel links so that host processors can be linked to the network through more than one line.

Network Services offers customers who are implementing data networks the following services: installation support; Information Exchange facility; operational and management support; and enhanced network support functions.

Installation Support

Network Services provides the evaluation, analysis, design, installation planning coordination, testing, education, and training required to install a data communications network. Installation support consists of the following key phases:

Implementation Planning—IBM IN systems engineers work closely with customers in planning any host-site changes and remote-site requirements. IBM systems engineers and marketing representatives assist in preparing a detailed implementation plan (including necessary software upgrades and migration, host-site hardware upgrades, and physical planning and site preparation plans for terminal locations). The plan also includes education and training.

Installation Coordination—IBM IN systems engineers coordinate the overall installation effort to provide compatibility between scheduled dates for equipment and line installation. Working with a Service Administrator designated by the customer, site preparation at terminal and host locations is closely coordinated to facilitate smooth installation.

Installation and Testing—customer host processors are attached to IBM IN with either a Systems Network Architecture (SNA) or IBM IN Binary Synchronous Communications (BSC) emulation interface. IBM 3270 terminals Synchronous Data Link Control (SDLC) or BSC are supported for interactive communications with either host interface type. Network Services requires only standard IBM software in host computers.

IBM IN verifies installation of communications facilities (lines and modems) through basic link tests. Installation of access lines, modems, and terminals at customer sites is the customer's responsibility, but Network Services provides detailed installation plans. Installation is certified complete when terminal users can access applications in customer host computers.

Connectivity Service (CS)—replaces the *Extended Network Attachment* and the dedicated leased-line port options. There are three options associated with CS. With the Enhanced Option, IBM IN orders, installs, owns, and

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manages the leased line from the IBM IN node to the customer's premises and provides the dedicated leased-line port on the Information Network Communications Controller and associated modems or DSUs/CSUs. With the Standard Option, the customer provides the modems or DSUs/CSUs. For the Alternate Option, IBM IN provides the dedicated leased-line port on the Information Network Communications Controller. The customer provides the modems or DSUs/CSUs and owns, orders, installs, and manages leased line. Table 5 (Page RC20-464-112) shows Connectivity Service installation charges.

Education and Training—education for the customer's Service Administrator is available from the IBM IN Education Center in Tampa. Service Administrators gain hands-on training in use of administrative functions of IBM IN. Also provided are sample materials for training remote-site personnel. IBM IN systems engineers can assist in customizing sample materials to meet each customer's network requirements.

Information Exchange

IBM IN designed Information Exchange to speed and simplify the transmission of business data between geographically separated computers. The service establishes store-and-forward, computer-to-computer communications among company locations, such as headquarters and regional and branch offices, or between different enterprises, such as a manufacturing company and its suppliers.

Information Exchange features include:

- Network attachment by leased or dial line of a wide variety of remote job entry workstations, minicomputers, and large processors, including architecturally dissimilar systems, with interfaces for asynchronous, bisynchronous, and synchronous data link control protocols.
- Message routing to single or multiple destinations, with the option for requesting acknowledgement of message receipt.
- Flexibility in message size and content; transmit brief and free-form electronic memos or business data such as inventory status or purchase orders.
- Flexible message grouping that connects a related set of messages and automatically routes them to a designated processor.
- Two priority levels for queueing messages in storage, and an express delivery option for transmitting messages immediately.
- Direct routing of selected messages to the designated computer's application programs.
- Restart/recovery facilities to minimize communications costs.
- Easy expansion to accommodate additional users.

Information Exchange can be used from two types of sources:

- Application in a programmable device.
- Remote Job Entry from a workstation.

Information Exchange from a Programmable Device—an application running in a computer interfaces with Information Exchange through the use of a command language on an interactive basis. The following functions are performed:

- *Session start*, along with user ID and current password, relates the characteristics of the participating application to Information Exchange. It specifies restart/recovery techniques to be used if necessary and specifies any constraints on the size of logical data units for messages to be received.
- Send message specifies such information as user message identifiers, a description of the message, message destination, delivery class, any intermediate handling, and request for message acknowledgement.
- Receive message command gives full control of message delivery to the application. Parameters include ability to request messages when desired, selection of messages received by origin, data type, or delivery class, restricting message size, and instructions for handling received messages.
- Query status allows the application to inquire about the status of exchange sessions or the queue of messages awaiting delivery.

Protocols supported for programmable devices are Synchronous Data Link Control (which includes minicomputers capable of Systems Network Architecture as well as larger SNA systems) and Binary Synchronous Communication and asynchronous devices.

Remote Job Entry from a Workstation—remote job entry workstations interface with Information Exchange through the Job Entry System and an application running on the IBM IN MVS processor. The user submits a data set containing Information Exchange commands. The commands supported through this interface are session start, send message, receive message, and session end. Protocols supported for remote job entry interface are Synchronous Data Link Control and Binary Synchronous Communication.

Interface with IBM Personal Computer—an IBM IN software program can be installed in an IBM Personal Computer for communications with Information Exchange.

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The program is used to transmit data to, or receive data from, Information Exchange.

It provides interfaces to the Information Exchange session start, send message, receive message, list define, and session end commands. The product also manages the sending and receiving of personal computer files through Information Exchange.

Program functions help prepare data for an Information Exchange session, an invocation of Information Exchange immediately or at a user-specified time, and allow browsing of output received from Information Exchange.

Interface with SNA Host—a network program can be installed on an MVS host processor for communications with Information Exchange. It provides interfaces to the Information Exchange session start, send message, receive message, list define, and session end commands. It requires SNA VTAM (MSNF) and PL/1 transient library.

Electronic Data Interchange (EDI) Services—an IBM message service that supports industry codes for data handling. EDI involves the exchange in a standard format of such business transactions as request for quotes, quotes, purchase orders, purchase order acknowledgements, status requests and responses, shipping notices, invoices, and payment remittance advices. In addition, it allows the automation of routine transactions among regular trading partners. The software available from IBM for EDI applications supports such data standards as ANSI X.12, UCS, IIR/ACORD, and TDCC-based standards.

EDI Services—intended for virtually any business that operates a computer for inventory or production control and its regular trading partners control their operations with computer systems. EDI technology serves retailers, distributors, and manufacturers. IBM IN offers short-term data storage, optional archival storage, routing of data to multiple recipients using stored lists, security features, error recovery, Customer Assistance, and billing of multienterprise participants. EDI can help flag slow-moving items; detect sales declines; and reduce the time between ordering and shipping and between cancellations and response.

Operational and Management Support

IBM IN assumes responsibility for network operations and management, freeing customer DP personnel to meet central site and end-user requirements. Operational and management support provides the following services:

Network Operation—IBM IN operates the network with availability and performance in mind. Customers are responsible only for operating host-site hardware/software and remote-site terminals/control units.

End-to-End Facilities—using the Extended Network Attachment option, IBM IN provides end-to-end communications facilities management. IBM IN provides facilities (modems and leased lines) and related management services from the customer's premises to the IBM IN nodes.

Change Control—a range of support services assists customers with network-related change management. Services include recommendations on impact of IBM-distributed changes to Virtual Telecommunications Access Method (VTAM), Virtual Telecommunications Access Method Extended (VTAME), and Network Con-

	Enhanced ($)	Standard ($)	Alternate ($)
Point-to-point or the first point on a multipoint analog or digital line. Modem or DSU/CSU speeds of 2.4, 4.8, 9.6K bps.	915	735	570
Point-to-point or the first point on a multipoint analog line. Modem speed of 14.4K bps.	1,455	1,155	945
Point-to-point or the first point on a multipoint digital line. DSU/CSU speed of 56K bps.	3,660	3,600	3,120
Each subsequent point on an analog or digital line with modem or DSU/CSU speeds of 2.4, 4.8 or 9.6K bps.	180	90	No charge
Each subsequent point on an analog line with modem speed of 14.4K bps.	255	105	No charge
Each subsequent point on a digital line with DSU/CSU speed of 56K bps.	270	240.00	No charge

Table 4. Monthly Connectivity Service charges.

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	Enhanced ($)	Standard ($)	Alternate ($)
Point-to-point or the first point on an analog or digital multipoint line. 2.4, 4.8 or 9.6K bps.	900	450	400
Point-to-point or the first point on a multipoint analog line. 14.4K bps.	1,125	450	400
Point-to-point or the first point on a multipoint digital line. 56K bps.	1,175	450	400
Each subsequent point on a digital or analog multipoint line. 2.4, 4.8, 9.6, 14.4 or 56K bps.	550	300	250

Table 5. Installation charges.

trol Program (NCP) software; assistance in submitting change requests to IBM IN and technical assessment of changes submitted by customers; recertifying new configurations when required; and tracking changes.

Problem Management—from the moment a problem is reported (either on-line or by phone to the IBM IN Customer Assistance facility), Network Services manages it until resolved. On-line access to problem-management information and report distribution is available through the IBM *Information Network NOTIFY Service.*

Problem Determination—problem determination is a high-priority function of Network Services. For all users, the initial point of contact is the IBM IN. Trained operations personnel perform initial problem determination; if a problem is not resolved, it is assigned to second-level support functions. If a problem is determined to originate with the customer, it is referred to the Service Administrator. IBM IN provides "reasonable" assistance on customer-designated problems referred to the Service Administrator.

Service Administrator Support—customers have access to additional enhanced support functions to help Service Administrators make the best possible use of their data communications networks. These include the following:

- *Password Maintenance*—offers Service Administrators the option of handling password maintenance on behalf of users within the same account.
- *Application Access Control*—Service Administrators control access to applications in their host computers, by user ID or account ID.
- *Customer Assistance*—Service Administrators may call Customer Assistance any time with questions related to problem management, change control, or equipment inventory. If an answer is not readily available, an IBM IN Operations Representative provides additional assistance.
- *IBM Information Network Notify Service (NOTIFY)*—using NOTIFY, Service Administrators can request certain reports for routing to their own terminal printer and obtain status on problems within their account. CMS also offers access to problem-management functions (such as capability to answer and close problems assigned the customer for resolution).
- *Message Broadcast Facility*—permits Service Administrators to send messages to one or more users.
- *On-line News Facility*—Service Administrators also have access to the news facility and permanent storage to notify users of new functions on their host computer, or to provide other information valuable to users.
- *Status Facility*—allows Service Administrators to display the current status of terminals or users on command.

Management Reports—three management reports are available: *Problem Summary*, a weekly summary delivered on-line to the Service Administrator; *Problem Detail*, providing detailed problem information upon request; and *Equipment Inventory*, a list of the customer's network-attached terminal and control equipment delivered on-line.

CINFORM—provides authorized service administrators with information on current and year-to-date charges. Administrators can request on-line or printed reports. Reports include both usage charges and fixed charges. Usage charges for the current month and/or the previous month can be reported by user ID. Usage charges include processing activity and connect time. Fixed charges are reported in summary and include DASD, tape loads, restore activity, dedicated reports, and user IDs. Year-to-date information on total charges is also available. In addition, authorized users can print session level detail charge activity. The report provides information about transactions for each time the users log on to the network.

Enhanced Network Support

The following features simplify customer access to the network, while assuring data security and control:

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IBM Information Network (IBM IN)

User-Friendly Interfaces—entering only a user ID and password, users are prompted with a product selection screen that displays a menu of the applications they are authorized to access. A Help facility, when requested, provides users with additional information and assistance.

Security—security and authorization is performed by Network Services software. Network access is controlled by user IDs and passwords. User IDs must be valid for the specified account ID and the user's profile is checked for authorized applications. Access to applications not in the user's profile is restricted.

Password Maintenance—users can either maintain their own passwords, or allow their Service Administrator to maintain them. Passwords are stored in user profiles accessible at any time. This permits users to set their own schedules for changing passwords within the context of IBM IN security procedures.

Insurance

The *Insurance Communication Service (ICS)* from IBM IN is designed to speed and simplify communications between insurance agencies and companies. It solves a long-standing requirement: the capability for architecturally dissimilar agency computers and terminals located throughout the United States to communicate with one or more insurance companies. It provides a single, unified network that offers simplified communications at potentially reduced hardware and software costs, as well as faster turnaround for improved client service. The service is provided to an industry organization called Insurance Value-Added Network Services, which is headquartered in White Plains, New York.

ICS allows companies and agencies to communicate either through a direct connection or in the store-and-forward mode. ICS provides a comprehensive set of interenterprise support services that include network management, security, customer assistance, testing, user enrollment, billing and accounting, and education.

ICS offers the following services:

- Network attachment of a variety of computer terminals, minicomputers, and large processors.
- The ability for companies to provide interactive services to agencies.
- The ability to handle message transfer between agencies and companies immediately, or to store and later forward the messages in batches using Information Exchange.
- A variety of store-and-forward features, such as priority delivery, selective message retrieval, and message routing to multiple destinations.
- Implementation support for insurance industry transmission standards and transaction standards.
- Service interfaces for asynchronous, binary synchronous, and SNA protocols.
- The option for companies and agencies to access the network's remote computing services from terminals operating in interactive mode.

SOFTWARE AND DATABASE RESOURCES

IBM IN offers database resources to its subscribers. Some of these resources are specialized, like automobile valuations and registrations. Others, like airline schedule and fare information, are more general. While some of these services are provided by IBM, others are maintained by other companies.

DB-View provides access to four financial- and stock-related databases:

COMPUSTAT, which contains historical financial data on U.S. corporations, including balance sheets and income statements; *WORLDSCOPE*, which contains financial profiles and stock performance data on 4,000 companies in 24 countries; *TRADELINE*, which contains five years of daily pricing and dividend data on 6,500 common stocks from Standard & Poor's; and *I/B/E/S*, the investment broker estimating service containing earnings per share projections for 7,000 companies. The service also provides one set of tools for users to extract and process data found in a database.

Marketing Support Systems offers selected organizations using IBM mainframe computers an opportunity to connect to IBM IN for information about IBM products. *IBM-ISG* Marketing Support Systems consist of two products: *INFOExpress* provides such information as announcement letters, sales manual pages, configuration ads, and information about available education and publications. It also offers an electronic mail facility for communications between customers and their marketing representatives. *ASKINFO* enables a customer to ask technical questions about PCs. If no answer is available from the service, the customer can ask IBM to develop and file an appropriate answer.

Remote Screen Viewing Support Facility (RSVSF) allows a customer and the IBM support center to view the customer's computer session under customer control. The service permits work on MVS, VM, VSE, and programs that run under these operating systems for level 2 support service.

Wiltek Worldwide Communication Services is for corporations that want to link PROFS, MVS, or VM and Telex international communications. It can also be used to link internal message systems to public message systems and private networks to public networks.

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IBM Information Network (IBM IN)

> *Union Bank/Remote Terminal Processing* provides on-line retirement account management for financial institutions.

PMSC Motor Vehicle Report Processing Service allows insurance companies to obtain motor vehicle reports.

CONTROL is an interactive budgeting, consolidation, and financial reporting system for analyzing product profitability, corporate finances, cash flow, and personnel requirements.

Computerized Vehicle Valuation and VINguard Services provides insurance companies with on-line information about vehicle sales in the U.S. and Canada, used-car dealer inventories, local vehicle market value, and verification of Vehicle Identification Numbers (VINs).

On-Line Access: A service of American Express helps manage travel and entertainment costs and administers American Express programs. The service allows American Express' corporate customers to retrieve reports on their company covering monthly account control, card member activity, airline credit, and vendor analysis. Customized reports list top travel spenders, most frequent travelers, cardholders with past due charges, or those exceeding spending limits within their company.

Dow Jones News/Retrieval, a product of Dow Jones & Company, Inc., is an electronic business and news service, including business and financial news; current and historical stock quotes; detailed corporate data; and general news, sports, weather, and movie reviews. Full-text articles from *The Wall Street Journal* are included.

Westlaw, a service of West Publishing Company, is an on-line service geared to the legal community. It provides access to full-text federal, state, and specialized legal libraries.

Official Airlines Guide, Electronic Edition (OAGEE) provides up-to-date airline fare and schedule information for more than 2 million flights operated by more than 750 airlines within North America and around the world.

Soft-Switch Program links dissimilar word processing systems and enables users to transmit letters, reports, and other text. It's a multiple terminal product that links PROFS and other office systems for communications with each other. The program provides document translation, document distribution, and document storage functions.

MITROL is used to develop and operate applications in such areas as purchasing, inventory management, government contract management, banking and finance, and retailing. It consists of a request language, a database management system, and a teleprocessing monitor. ☐

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Industrial Life-Technical Services (IST)

COMPANY INFORMATION

Industrial Life-Technical Services
1611 Cremazie Blvd. East
Montreal, Quebec, Canada H2M 2P2
Telephone (514) 383-1611

Company Background

Industrial Life-Technical Services (IST) provides computer on-line services, remote batch services, and on-line databases. Established in 1974, IST, also known as L'Industrielle-Services Techniques, Inc., is a subsidiary of two mutual life insurance companies, Alliance-Industrial Financial Corporation and Cooperants Mutual Life Insurance Society. Since its founding, IST's employee base has grown to over 650 professionals, and the company has attained revenues in excess of $50 million.

IST's clients include the government; health and social affairs organizations; industries, businesses, and service firms; real estate and municipal affairs organizations; and financial institutions.

IST offers its clients the following:

- Remote batch processing services
- Time-sharing services
- On-line application processing services
- Scientific and engineering services
- Econometric and statistical services
- Facilities management services
- IST program products and services
- Data center backup services
- Technical support and programming services
- Training and education services
- Information services for the social affairs network
- Consulting services
- Information services for municipal governments

RESOURCES AND FACILITIES

Processing Center

IST's processing center is located in Montreal, Canada. The center mainly uses IBM technology and gives access to a Control Data Corporation (CDC) environment. The IBM equivalent complex is composed of:

Central Processing Units

- One Amdahl 5860 system
- One Amdahl 5870 system
- One Amdahl 5840 system
- One IBM 4381

Founded in 1974, Industrial Life-Technical Services' (IST's) primary objective was developing a large data processing service business in Canada. Today, IST offers a full range of computer products and services to specialized markets, as well as to government and business in general. IST is *primarily* known as a computer service bureau and ranks fourth in the Canadian computer services industry, according to Evans Economics.

IST's applications offerings include accounting, data communications, data management, medical and health care, social affairs services, municipal services, and farm industry services.

Direct Access Storage

- IBM 3350 direct access storage drives
- Memorex 3650 direct access storage drives
- Amdahl 6880 direct access storage drives
- IBM 3380 direct access storage drives

Magnetic Tape Storage

- 34 Memorex 3226 tape drives

Unit Record Devices

- STC 2250/1200 line printer
- Sand SP 1250 line printer
- Two Xerox 9700 laser printers
- Xerox 8700 laser printer

Local Communications Devices

- IBM 3274 Model 31D and 41D control units
- IBM 3278 Model 2 display units
- Memorex 2078 Model 2 display units
- IBM 3279 display units Model 3B
- IBM 3287 Model 2 line printers

Telecommunications Devices

- 4 Amdahl 4705 communications processors
- Spectron switch units that support remote configuration

System Software

OPERATING SYSTEMS: IST uses IBM's MVS with JES/2 as the primary operating system in the IBM environment. IST also offers IST/TSO, an enhanced version of the IBM time-sharing system. IST/TSO is a full function system providing the IST user with almost every capability of the MVS operating system at the time-sharing terminal.

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Industrial Life-Technical Services (IST)

LANGUAGES: IST supports the following languages:

- APL
- Assembler G and H
- ANS VS Cobol
- PL/1 optimizing compiler
- VS Fortran

PROGRAM DEVELOPMENT AIDS: IST provides its clients with the following productivity aids:

- TSO/SPF
- Wilbur

DATA COMMUNICATIONS: IST provides on-line application processing services through its CICS/IST. CICS-transaction processing service (CICS/IST) is IST's shared transaction processing service. It is an interactive application processing system which frees clients from controlling on-line systems, and enables them to concentrate on their applications. CICS/IST enables clients to share software, expertise, and hardware.

DATA AND DATABASE MANAGEMENT: IST provides the following data and database management systems:

Questel Plus—an information retrieval software package for mainframe computers. It allows the computerization of textual and numeric files, loading process, updates, interactive search from numerous users, as well as complementary features such as off-line printing, etc. The software is designed for public and private information centers, as well as on-line publishers and vendors.

Micro-Questel—a management information software package that runs on a microcomputer. It allows the computerization of various data within an information center. The user may define database structure, proceed to on-line data entry, and search its files via numerous criteria. The software is designed for any institution, corporation, company, and specific service, in order to implement a local information management system.

Extracto—a high-level file management system primarily oriented toward the printed output phase of data processing. Extracto provides file creation as well as updating facilities. Designed to retrieve data selectively from input files and to print reports, Extracto requests take an average of 20 minutes to code, but generally execute as fast as specially tailored Cobol programs. For personnel without any previous programming experience, instruction in the use of Extracto takes an average of one day. This is possible because essential data-handling logic is ready-built into the Extracto system, and the user provides only simple, English- or French-like statements to specify particular needs, thereby, freeing the programmer for more complex tasks.

Customer Support Services

IST provides a broad range of technical support services.

Customer Services—provides the link between the various operation facilities. Customer Services is the focal point of contact for all user communications regarding the use of IST computer services. In the majority of cases, Customer Services can handle user inquiries on the spot. For those items which require specialized technical knowledge, customer services will provide the appropriate person to ensure that the request is properly met.

IST Consultants—IST data processing consultants have the necessary technical knowledge and experience to assist the client in the development of many applications and in the maintenance of existing systems by indicating those IST products which best fill each need and by optimizing the use of these products.

IST's consultants help clients develop applications and maintain existing systems by recommending appropriate IST products, and helping clients optimize their use of these products.

Sales and Marketing Services

IST marketing representatives are located in the following Canadian cities:

- Montreal, Quebec
- Quebec, Quebec
- Toronto, Ontario
- Ottawa, Ontario

APPLICATION-SPECIFIC SERVICES

IST application packages incorporate a range of products for all areas of activity. Programs in this category include facilities to support statistical analysis, economics, and data management.

Statistics

The following statistical analysis packages are offered by IST:

- SAS
- SPSS

Economics

Troll—a totally interactive system designed for quantitative research in economics and other social sciences. Troll offers three research capabilities:

- Data analysis and transformation
- Regression
- Simulation

A modeling language is used for writing equations and models (equation system), and provides a consistent interface between the researcher and the three capabilities mentioned above. The researcher specifies experimental relationships in the form of equations which he/she stores in Troll. To test these relationships, the researcher types

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Industrial Life-Technical Services (IST)

commands on the terminal that execute computations on the equations and associated data. To respecify relationships, the user gives commands such as Add, Delete, etc. No programming skill is required; the researcher can devote virtually all his/her attention to problem analysis.

Other IST statistical program product offerings enabling the user to perform various types of analysis and manipulation of data include:

- EPS
- Databank
- Massager
- Mosaic
- Symsis

Data Management

Easytrieve—a proprietary software package from Pansophic Systems of Canada Limited. Support is provided by both the IST and Pansophic product support staff in order to continually enhance the product.

The main objectives of Easytrieve are:

- To make it possible for any individual to turn out routine jobs (e.g., an urgent inventory report) in the fastest and most simple manner.
- To free the programmer from all routine jobs so the programmer is available to complete the schedule for complex tasks, without constant interruptions for trivial tasks.

Data-Man—a general commercial system designed to handle the data processing requirements of business. This system performs data validation, file creation, file updating, data retrieval, and the preparation of reports. The system is used to construct and maintain complex files, as well as provide for data retrieval and reporting.

Data-Man is particularly suited to repetitive production jobs and commercial applications, such as:

- General accounting
- Job costing
- Student records
- Sales analysis
- Accounts payable and receivable
- Payroll
- Personnel statistics
- Inventory

Other file management systems offered by IST include:

- Librarian
- Panvalet

INDUSTRY-SPECIFIC SERVICES

Information Services for Health Care Institutions

IST offers the following social affairs services:

- Administrative management systems, including the data processing directly related to the planning and control of human, financial, and material resources management.
- Institutional management systems, including the process support information related to the establishment's activities regarding pharmacy; radiology; and the recipients of services such as admissions, pharmacy, patient care, radiology, appointments, etc.
- Medical management systems including the information processing directly related to the medical activity itself; preventive care, diagnostic, or curative.
- Medical research and socio-sanitary systems.

Information Services for the Municipal Sector

IST provides information management systems to meet the requirements of municipalities. The following application programs are available via IST:

GIM (Municipal Management Information System)—offers information on global management of real property, finance, and administration.

Pegase System—a spatial telemetry management system for the Quebec Ministry of Transportation, including retrieval of geographical information, computerized geographical representation, and five-year planning.

SIC System—an integrated spatial information management system for commercial and financial applications.

L'Eclaireur System—an information system for school management facilities related to school transportation.

Horizon System—covers school transportation planning on microcomputers.

Apogee System—an integrated municipal information management system.

Other software packages available through IST include library, inventory, municipal court, and civil engineering. IST provides the information management system best suited to meet the needs of a municipality.

Information Services for the Health Care Sector

IST provides a global and integrated solution to the information management needs of health establishments. IST offers information management consulting, user training, and the following application software programs:

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▻ Human Resources Management
- Employee files
- Collective agreement management
- Job management
- Absenteeism control
- Personnel statistics

Financial and Material Resources Management
- Financial statements
- Accounts payable and receivable
- Inventory control
- Payroll calculations
- Billing
- Model building

Patient Care Management Services
- Patient index
- On-call list, preadmission, admission
- File control
- Bed occupancy
- Outpatient clinics

NETWORKING SERVICES

In addition to conventional networks, IST offers its users networks such as SNA/SDLC and DATAPAC, which are fully compatible with its services.

ON-LINE DATABASES

IST offers its clients access to several on-line databases. Detailed descriptions of most of these databases may be found in the On-line Databases section (OL40) in Volume 1 of this publication.

Audiovideo—includes French Canadian, Canadian, and other foreign country audiovisual references.

Logibase—includes software available in Quebec, that can be used on micro-, mini-, or mainframe computers.

Jouets—games and toys for young children, as well as adults.

Publiq—includes publications produced and published by or for various Quebec government ministries.

Choix—includes French monographs and serials.

Eduq—covers information on Quebec education, including institutions at all levels.

Diplomt—an index to the publication "Le Monde Diplomatique" which covers main events on the international scene.

Doge—a bibliographical database providing management information on firms.

ACIDOC—an international bibliography that covers all aspects related to acid rain.

Quebac—contains indexed information from the newspapers "Le Devior", "La Presse", and "Le Soleil".

Envirodoq—a bibliography of the literature on the technological, planning, legal, geological, and social science aspects of the environment of Quebec.

Badicom—a bibliography of the literature in the field of communications.

Hiscabeq—contains citations to monographs, theses, and articles from more than 250 periodicals on the history of Quebec and Canada.

Repere—contains bibliographies of general interest articles from over 970 magazines published in Quebec.

CANSIM—produced by Statistics Canada. CANSIM contains monthly, quarterly, and annual time series related to internal activities of Canada, as well as external trade.

OTHER PROFESSIONAL SERVICES

Consulting

IST's professional services group consists of people who are experienced in systems analysis and programming. Clients call on these consultants when they require specialized experience for particular applications. According to the company, IST's consultants can handle any stage of system installation starting with the feasibility study and initial development to implementation and final documentation. □

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Informatics General Corporation

A leading supplier of software services, Informatics General Corporation was founded in 1962. Today, Informatics and its subsidiaries develop and market a broad range of computer software products and other computer services used to efficiently and productively manage information. These products and services, which are marketed to businesses, governments, and scientific and educational institutions in the United States and around the world, consist of the following: software products, such as implementation and systems products and application products; professional services for both federal and commercial environments; information processing services, such as database services, information management services; and data services for federal, industrial, and general applications, particularly, distribution.

COMPANY INFORMATION

Informatics General Corporation
21031 Ventura Boulevard, 8th Floor
Woodland Hills, CA 91364
Telephone (213) 887-9040

Company Background

Informatics General Corporation was founded in 1962 by a small group of computer specialists to supply software services. The company grew at a steady pace, and in 1967, offered its first proprietary software product. As the software industry grew during the mid 1960s and 1970s, Informatics continued to offer new products and services. Informatics General Corporation now offers software products and services for IBM, IBM-compatible mainframe, minicomputer, and microcomputer environments.

Informatics has offices across the United States, in Canada, Europe, Latin America, and the Far East, providing support to customers in 44 countries.

Competitive Position

Informatics is one of the world's largest independent suppliers of computer software products and services. The California-based company now has offices in 45 U.S. cities and more than 15 overseas cities. Informatics' revenues grew by 26 percent in 1984, with revenues exceeding $191 million.

Whereas, previously, Informatics "had an egg in every basket," according to a company spokesperson, Informatics is now concentrating its efforts on its software services, and deemphasizing its timesharing services. As part of this change in policy, in the spring of 1984, Informatics sold its Data Services Operation, based in Fairfield, NJ, to Litton Computer Services.

RESOURCES AND FACILITIES

Processing Centers

Informatics' two data centers contain a variety of IBM and IBM-compatible mainframes and a number of minicomputers. Each data center supports specific applications as indicated below.

The Columbus, OH center supports Informatics' wholesale and distribution applications for hardware, drug, industrial supply, plumbing and heating, and many other lines of trade. Hardware at this site includes an Amdahl V6 Model II and two IBM 370/168 mainframes.

The data center in Riverdale, MD supports database and document processing for insurance, legal, library, clearinghouse, and photocomposition applications using a NAS/AS5000 and an Amdahl V6 Model II mainframe. Comten 36XX communications front-end processors link these computers to the Informatics teleprocessing network.

Systems Software

OPERATING SYSTEMS: The Informatics computer centers support a number of operating systems, including:

- OS MVS/JES2
- OS VM/CMS
- OS MVT/ASP
- OS SVS/HASP
- OS/SVS2

UTILITIES: Informatics operating systems within the computer centers include a comprehensive set of utilities to perform a variety of standard services. These utilities are inherent to the remote computing services, and, in most cases, are not offered as separate products.

- *TAPS*—a systems development tool that assists in the development and maintenance of on-line systems. TAPS includes its own communications manager, a screen painting capability, a data and transaction manager, a restart/recovery capability, and access security procedures.

- *Echo*—a comprehensive link between all components of the Informatics time-sharing and batch systems and users' computers. Clients can thus use all Informatics' hardware, software, and communications facilities and pay on a resource-used basis. Echo allows a user to transfer jobs between time-sharing and batch modes, creating programs in the more efficient interactive environment and then testing and running them in the more economical RJE system. Alternatively, users can develop, debug, and test programs using Informatics' ▷

▷ time-sharing services and then run production on their own in-house computer. Echo contains an important subproduct, CRJE (CMS/Remote Job Entry), which allows for the job transfer between time-sharing and batch modes. CRJE also enables a user to control batch jobs from his or her terminal.

- *Exec*—a versatile command language used to customize and simplify terminal procedures. Exec allows a user to define new commands as combinations of existing CMS commands, producing simple or complex sets of procedures. The new commands provide a facility similar to OS-cataloged procedures for CMS users. Exec contains a number of built-in functions to test data types and lengths and to concatenate variables as well as branching capabilities and an argument list. CP/CMS commands, other Execs, logic control statements, loop statements, statement labels, program contents, arguments, and built-in Exec functions may all appear in the Exec command definition.

DATA AND DATABASE MANAGEMENT: Informatics offers the following database management systems:

- *Mark IV*—a reporting and data management system, developed by Informatics, Inc., capable of producing up to 255 reports in a single pass of the database. Mark IV is most useful in applications where the structure of the database remains relatively constant. Mark IV provides powerful production and ad hoc reporting facilities to users with extremely large databases containing complex relationships between data items.

- The Mark IV command language allows programmers to develop applications 6 to 10 times faster than is possible using conventional programming languages. Mark IV includes facilities to link it to other systems or databases and to allow it to be referenced from applications written in conventional programming languages. Mark IV can also be licensed as a standalone product from Informatics.

- *Recon IV*—provides a natural language retrieval system for the storage and retrieval of textual information using stop word indexing, controlled and uncontrolled vocabularies, and thesaurus terms. Recon IV is ideal for the searching of large collections of textual information with advanced search techniques, such as phase, word proximity, word root, and universal character. Recon IV was developed by Informatics and is available to be licensed as a standalone software system or for use at the Informatics data centers on a processing-service basis.

LANGUAGES: Informatics provides the full range of language processors with complete services for compiling, testing, debugging, and executing programs in batch or time-sharing modes. The most commonly used languages include:

- Assembler
- VSBasic—an advanced Basic with an interactive debug facility, an increased maximum number of program statements, the ability to store and use object code, and many new I/O capabilities.
- Fortran IV
- Fortran H
- Watfiv
- ANS Cobol
- PL/1 Optimizer
- PL/1 Checkout

PROGRAM DEVELOPMENT AIDS: In addition to the full range of language processors, Informatics has developed several program development aids to maximize the efficiency and minimize the time required in system development.

Informatics program development aids include:

- A multilanguage integrated symbolic debugger
- Efficient test data generator
- Two powerful interactive editors
- An efficient support system for IMS application development
- A command language for customizing and simplifying terminal procedures

Customer Support Services

Informatics provides its clients with supportive services, including: comprehensive documentation, continuing education programs, information systems consulting, installation support, and conversion assistance.

Informatics educational programs address the specific needs of users in successfully specifying, implementing, and using Informatics information management systems.

Informatics field systems consultants are assigned individually to each subscriber and make regular visits to subscriber sites. They also provide on-going assistance and liaison services with the Informatics system specialists.

Sales and Marketing Services

With offices in more than 45 U.S. cities and more than 15 overseas cities, Informatics provides a full range of sales and marketing services to customers in 44 countries.

APPLICATION-SPECIFIC SERVICES

Data Communications

CICS (Customer Information Control System)—a teleprocessing monitor from IBM, CICS controls multiple terminals associated with many application programs running under CICS. CICS isolates those application programs from the details of communications control, while providing screen formatting utilities, error recovery and logging, file and database access control, and resource management. CICS programs can be written in Cobol, Assembler, or PL/1. ▷

Informatics General Corporation

▷ Mathematics and Statistics

SAS—a powerful data and statistical analysis package from SAS Institute, which includes a PL/1-like, high-level programming language, a report writer, and an interactive color graphics capability. For data maintenance and analysis, SAS includes the following file handling facilities:

- Subsetting
- Concatenating
- Sorting
- Match merging
- Interleaving
- Updating
- Storing and retrieving

More than 50 procedures are included in SAS to perform statistical analysis that range from simple statistics to complex multivariate techniques. Statistical facilities include:

- Analysis of variance and covariance
- Correlation analysis
- Discrimination analysis
- Factor analysis
- Frequency and cross-tabulation tables
- Simple and multiple linear regressions
- Matrix manipulation
- Nonlinear regression
- Stepwise regression
- T-tests

INDUSTRY-SPECIFIC SERVICES

Distribution

Distribution IV—a custom-tailored, state-of-the-art information management system developed by Informatics for the distribution industry. Informatics provides specialized services through Distribution IV inventory, marketing, financial, and retail customer services. Distribution IV supplies automated day-to-day business controls, including:

- Order processing
- Back-order processing
- Customer invoicing
- File maintenance
- General accounting
- Accounts receivable
- Accounts payable
- General payroll
- Inventory management
- Scientific buying and forecasting
- Buying and purchase order writing

Distribution IV also provides critical information in such areas as:

- Gross margin management
- Pricing strategies
- Inventory management
- Consumer receivables
- Sales analysis
- General ledger and financial control

Distribution IV offers the capability to custom-tailor a virtually limitless combination of management information reports, including:

- Sales mix management
- Sales service analysis
- Vendor analysis
- Item analysis
- Gross margin planning
- Salesmen margin performance
- Merchandise classification analysis

Distributed Data Processing System (DDPS)—an Informatics turnkey system supplying Distribution IV software products on DDPS is configured to the individual operating environment to provide remote, interactive, on-line facilities for interfacing with Distribution IV inventory, marketing, financial, and retail customer information management systems. Highly user-oriented order entry, file inquiry/maintenance, and screen formatting features allow nontechnical personnel to effectively use the system quickly and with minimal training.

Ordernet—an Informatics service for distributors and manufacturers with virtually instantaneous transmission of purchase orders and related information over the Informatics communications network. Ordernet's facilities allow distributors to place multiple manufacturers' orders at one time and in the same format without having to purchase the multiple types of computer hardware and software needed to communicate directly with different manufacturers. These facilities benefit both distributors and manufacturers by increasing service and sales, while decreasing inventory and lead times.

Informatics has developed several versions of their Ordernet software to meet the individual needs of specific lines of trade, including drug wholesalers, surgical supply, distributors, service merchandising, chain drug firms, hardware wholesalers, and manufacturers, and several versions that provide transmission of other industry-specific documents.

Ordernet user groups meet periodically to discuss system enhancements and recommendations, to initiate group planning and strategy sessions, and to share members' ideas and experiences.

Library Services

PC/NET-LINK—an application software package that provides an index to the several hundred databases available from major database vendors such as DIALOG, BRS, and SDC. The software also has an internal notebook of search commands for each system access, automatic dial up and log on to the databases selected, full password control and system security, a NEWS function, HELP screens, and user-maintainable files of password, protocol, and index terms. Even a local host system can be added if the host supports dial access. The system is written in dBASE II, ▷

▷ and uses Genasys' Telios for communications. The hardware required is an IBM PC/XT with 128K of RAM memory, a Hayes Smartmodem 1200, and any IBM PC-compatible printer.

NETWORKING SERVICES

The Distribution and Retail Systems Division maintains a communications network of dedicated telephone lines linking customers to the central processing facilities in Columbus, OH. Comten 36XX communications concentrators link the computers at the two Informatics data centers to their teleprocessing network, allowing communications with low-, medium-, or high-speed terminals, or the user's own computers.

A broad range of terminals can be connected to the Informatics network, including mainframes, minicomputers, and microcomputers from most major equipment vendors. Terminal transmission data rates are: 300, 1200, 2400, 4800, 7200, and 9600 bps. Supported transmission codes and protocols are EBCDIC, HSP Multileaving, and 327X Bisync.

ON-LINE DATABASES

Informatics supports a number of public and private on-line remote batch databases on their systems. Private databases are part of the Distribution IV system in an on-line batch mode. Detailed information on most of these databases may be found in the On-line Databases section (OL40), in Volume 1 of this Directory.

Distribution

Informatics Distribution IV databases, maintained by the Distribution and Retail Systems Division, contain distribution-related information. Database reporting is made available on-line upon subscriber request. Added flexibility is offered through extensive report generating capabilities.

OTHER PROFESSIONAL SERVICES

With a broad range of capabilities in all three segments of the computer software and services markets (software products, professional services, and information processing), Informatics provides clients with these additional professional services:

- Facilities management
- Software package sales
- Turnkey systems sales
- Maintenance (software maintenance is totally Informatics' responsibility; hardware maintenance is handled by the respective vendors)
- Training programs
- System consulting
- Systems Engineering and Integration

FUTURE PLANS

Informatics will continue to emphasize the three main areas of its present business—professional services, software products, and information processing services for IBM or IBM-compatible mainframe environments.

The company also recognizes the importance of the minicomputer and microcomputer segments, and will continue to add more offerings in this area, including software packages, services, and turnkey standalone systems. Turnkey systems are now available for CPA and law office management systems, as well as photocomposition capability. ☐

Inforonics, Inc.

COMPANY INFORMATION

Inforonics, Inc.
550 Newtown Road
Littleton, MA 01460
Telephone (617) 486-8976

Company Background

Inforonics, Inc., a privately held company based in Littleton, MA, was founded in 1962 to provide services to the publishing and library industries. Inforonics' 50 employees provide a broad range of remote computing-based applications processing to meet the needs of this market, from automated production of reference books to one-stop library automation services.

Inforonics consists of three divisions:

- Library Automation Services (ILIAS)
- Text Processing Services (TPS)
- Research, Development, and Consulting Services

The *Library Automation Services* division supplies libraries and other information centers with bibliographic data processing services. Inforonics' staff assists clients in creating, searching, and maintaining their databases and in searching the MARC II database. Once a client database is established, numerous labels and lists can be generated from the database, including:

- Catalog cards
- Spine labels
- Circulation labels
- Accessions lists
- Typeset catalogs
- Lineprint book catalogs
- COM catalogs
- Union lists

Other Library Automation Services division services include:

- Professional cataloging
- OCLC archive tape maintenance
- Union lists of serials
- Journal distribution systems

The *Text Processing Service (TPS)* division provides total systems that begin with a manuscript and end with printer-ready copy and a machine-readable file. Businesses, professional societies, and publishers use the TPS services and produce catalogs, directories, bibliographies, abstracts, indexes, dictionaries, thesauri, and manuals. A diagram of the interface between a publisher and the Inforonics TPS system is shown in Figure 1, Page OL20-497-102.

In addition to computer typesetting services, TPS provides many data manipulation functions useful in compiling indexes and questionnaires. Typical TPS applications include:

Inforonics, Inc., based in Littleton, MA, provides database design, on-line editing and database management, full text processing and phototypesetting, and library automation services. Clients include businesses, professional societies, and government agencies.

Inforonics services include TPS, a Text Processing System, ILIAS, the Inforonics Library Automation Service, and computer typesetting.

Inforonics clients publish reference books, directories, bibliographies, indexes, guides, and manuals. Inforonics also provides easy-to-use search programs geared to several on-line publishing-oriented databases. The TPS system provides a total computer-based publishing capability, from manuscript to printer-ready copy.

- Abstract journal production with output in hard copy, microform, and magnetic tape formats
- Automated index production
- Directory systems, including questionnaire generation
- Membership directories
- Publishers' catalogs

The *Research, Development, and Consulting Services* division provides consulting services in all areas of interest to libraries and publishers. Production services include:

- Computer composition
- Computer typesetting
- Mechanized publishing
- Data file maintenance
- Library catalog data processing
- Information storage retrieval
- Research and development in information design
- Computer programming in the library science area

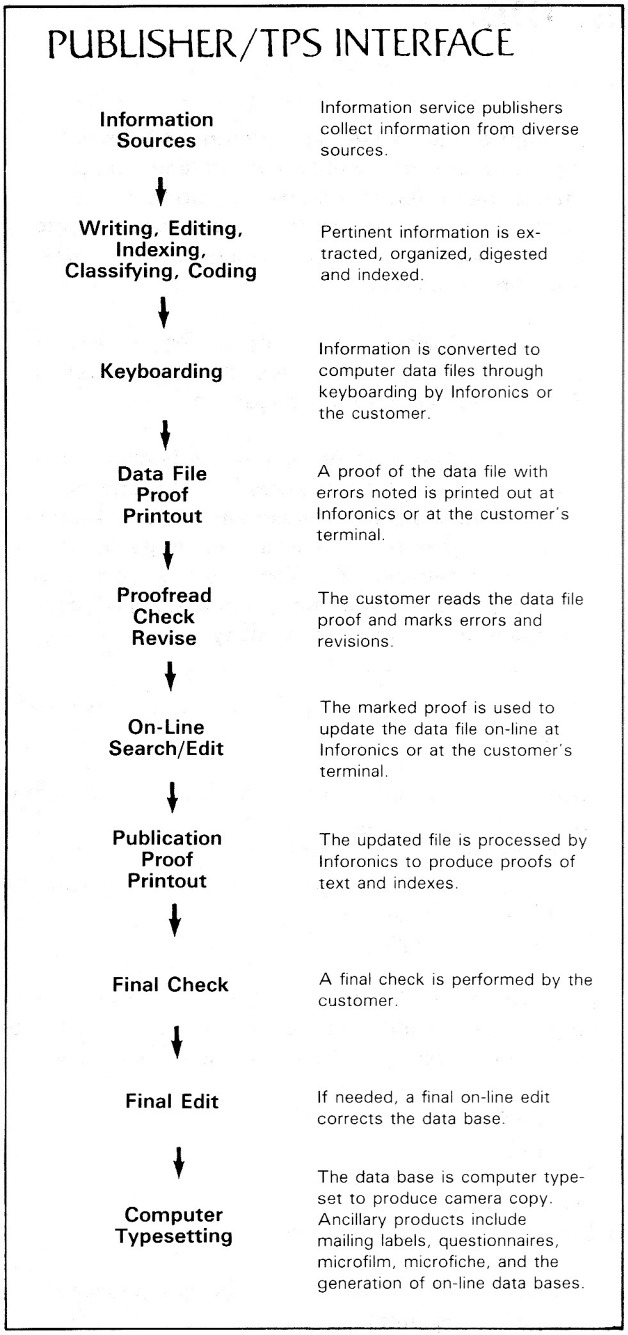
RESOURCES AND FACILITIES

Processing Centers

Inforonics uses an on-site Digital Equipment Corporation DECsystem-10 mainframe computer system. Equipment for accessing the DECsystem-10 includes eight on-line terminals and a variety of input devices for processing customer input. Data input can be generated via magnetic tapes, word processing diskettes, or through microcomputers.

Inforonics has recently acquired a DEC 1091, which provides an increased processing capacity and also maintains reduced costs for larger processing jobs.

▷



PUBLISHER/TPS INTERFACE

Information Sources	Information service publishers collect information from diverse sources.
Writing, Editing, Indexing, Classifying, Coding	Pertinent information is extracted, organized, digested and indexed.
Keyboarding	Information is converted to computer data files through keyboarding by Inforonics or the customer.
Data File Proof Printout	A proof of the data file with errors noted is printed out at Inforonics or at the customer's terminal.
Proofread Check Revise	The customer reads the data file proof and marks errors and revisions.
On-Line Search/Edit	The marked proof is used to update the data file on-line at Inforonics or at the customer's terminal.
Publication Proof Printout	The updated file is processed by Inforonics to produce proofs of text and indexes.
Final Check	A final check is performed by the customer.
Final Edit	If needed, a final on-line edit corrects the data base.
Computer Typesetting	The data base is computer typeset to produce camera copy. Ancillary products include mailing labels, questionnaires, microfilm, microfiche, and the generation of on-line data bases.

Figure 1. Steps followed by Text Processing Service users.

▷ Inforonics produces its photocomposition output on a Harris Intertype Fototronic unit.

Customer Support Services

Inforonics provides customer support and sales and marketing services from its Littleton, MA headquarters.

APPLICATION-SPECIFIC SERVICES

Data and Database Management

DB-Edit—a powerful text validation and on-line access system designed for in-publication databases. DB-Edit functions allow easy manuscript file control during data collection, copy processing, and revision.

DB-Search—a system to search large or small databases and retrieve subsets of the database information. DB-Search uses simple queries that can be combined, along with a "wild card" option, to allow maximum access to database information. Users may search on-line catalogs, indexes, and bibliographies, in addition to other standard publishing databases.

TexTerm—a database input system designed for easy entering of text at a publisher's location through a standalone input system. A powerful validation capability assists in maintaining quality control. Both fixed- and variable-length fields and subfields are accommodated by TexTerm. Users define field tags, screen prompts, explanatory labels, and validation requirements through a control file. Multiple control files for differing record types can be used on the same input system installation. TexTerm is compatible with the IBM PC.

Standard TexTerm features include:

- *New File* with tag prompting, data validation, and data correction capabilities
- *Print* for proofreading and editing
- *Edit* for modifying and revalidating text in a full-screen edit mode

DirecText—offers a complete service for automating directory production, including automatic sorting, indexing, and typesetting of directory entries; easy updating; questionnaires; mailing lists; supplements; regional or subject-specific editions; and microfiche. DirecText is flexible and allows publishers to use only the services they need, as well as allowing many areas of production to remain in-house.

INDUSTRY-SPECIFIC SERVICES

Inforonics' customer base consists of publishers, libraries, and professional societies. Its product line reflects this specialization, with the majority of its products geared to this information industry. The remainder of the Inforonics product line is geared toward data and database management.

Media

IBIS—the Inforonics Bibliographic Information Service that provides access to ISSN, author/title, keyword, subscriber, order number, and vendor code information. Output may be subscription lists, unit lists for multilocation libraries, binding slips, and routing labels. Inforonics recently added a new journal subscriptions management feature to IBIS.

ILIAS—the Inforonics Library Automation Service that provides bibliographic data processing services to libraries and other information centers. Services include on-line searching of the MARC II Library of Congress databases. ▷

Inforonics, Inc.

▻ *TPS*—the Inforonics Text Processing Service, a total system that begins with a manuscript and ends with printer-ready copy. TPS typesets text and performs data manipulations for compiling reference books, indexes, directories, guides, abstract journals, dictionaries, manuals, and reference books. Other TPS features include file maintenance, data access, data manipulation, and typesetting.

Inforonics has expanded its TPS system by adding *TitleBank,* a complete book catalog and marketing support system used by publishers to maintain on-line files of their book information. TitleBank provides an on-line record of each title, with bibliographic, sales, and review information and can be tracked through the planning, editorial, production, and marketing processes. TitleBank also generates forms for book jobbers automatically.

NETWORKING SERVICES

Inforonics does not support a network since they use a DEC 10 computer system in-house. Customers deliver data on-line via direct dial to Inforonics site for processing; output is then delivered to the customer.

ON-LINE DATABASES

Inforonics specializes in databases for the publishing and library industries. Detailed information on most of these databases may be found in the On-line Databases section (OL40) of this publication.

Bookline Alert: Missing Books and Manuscripts (BAMBAM)—the Bancroft-Parkman, Inc. database containing information on missing books and manuscripts. The book or manuscript must be worth at least $50. Citation information includes a physical description of the missing item. Losses may be reported anonymously when necessary.

Bookline Utopia—the Bancroft-Parkman, Inc. database describing rare, antique books and manuscripts that are sold at auction in the U.S., Great Britain, and other selected world auction centers. Information includes a physical description of the item, its current value, any previous sales information, and selected bibliographic information. Current database information covers books and manuscripts sold at international auctions from 1975 to the present; information is also available for other selected items auctioned prior to 1975.

MARC II—the Library of Congress database that contains information on acquisitions, cataloging, and reference services.

OTHER PROFESSIONAL SERVICES

Inforonics provides consulting, research, and development services in all areas of interest to libraries, publishers, and professional societies. Microfilm services are provided through the TPS and Library Automation Services divisions.

Customer database duplication and distribution services are available, along with specialized on-line search systems for private databases.

Any computer-readable record used by the TPS system can be reorganized, reconstructed, composed, and translated for publication elsewhere.

Inforonics offers its TexTerm capability on Zenith Z-100 microcomputers and IBM PCs. Data is transferred to the DECsystem 10 computer where Inforonics runs its standard TPS software.

FUTURE PLANS

Inforonics plans to continue the enhancement of its products to further assist libraries, publishers, and others to easily publish products and create and maintain databases. ☐

ITT Dialcom, Inc.

ITT Dialcom Inc., is considered a pioneer in the development of electronic mail services. A unit of ITT Corporation, ITT Dialcom was founded as Dialcom, Inc., in 1970, and was acquired by ITT in 1982. Electronic mail is still the company's major offering. However, Dialcom also offers access to several databases and information retrieval services including Dow Jones News/Retrieval, Official Airline Guide, UPI News, A.P. Videotex, and ABI/Inform. In addition, the company provides gateway links to other databases, and offers electronic publishing, correspondence and mailing systems, database management systems, file transfer capabilities, and PC-based systems such as PCMAIL.

ITT Dialcom's customers are primarily Fortune 1000 companies, government, and major professional organizations. ITT Dialcom is accessible through domestic and international public data networks, including Tymnet, Telenet, and Uninet.

COMPANY INFORMATION

ITT Dialcom, Inc.
1109 Spring Street
Silver Spring, MD 20910
Telephone (301) 588-1572

Company Background

ITT Dialcom was founded in 1970 as Dialcom, Inc. Established to provide computer time-sharing services, the company remained privately held until 1982, when it was acquired by ITT Corporation, a recognized leader in the telecommunications industry. ITT Dialcom now operates as part of ITT's Communications Operations and Information Service Group.

Dialcom embarked on a vigorous acquisitions program shortly after its founding. Within two years, the young company had acquired the assets of several smaller time-sharing companies. As a result, the Silver Spring, MD-based company was able to expand its market base to encompass New York City, Philadelphia, Minneapolis, and Chicago. In the mid 1970s, Dialcom began developing applications software for the office automation marketplace, anticipating a decrease in the demand for time-sharing services. During this time, the company also decided to make electronic mail the cornerstone of its product line. In 1975, Dialcom began developing its electronic mail system in earnest.

In addition to its electronic mail service, ITT Dialcom offers information retrieval services geared toward businesses and government. These services are integrated through Dialcom's Automated Office System—an electronic mail/database service.

Dialcom's primary service, however, is electronic mail, just as the company had envisioned in 1975. By any measure, Dialcom is a leading vendor of electronic mail services, both nationally and internationally. Nationally, Dialcom counts among its clients Westinghouse Corporation, the accounting firm of Peat, Marwick, Mitchell & Co., and the Johnson & Johnson, Xerox, and Marriott corporations. Internationally, ITT Dialcom's Global Mail Network links identical systems in the United Kingdom, Canada, West Germany, The Netherlands, Puerto Rico, the U.S. Virgin Islands, Australia, Hong Kong, Singapore, Korea, and Denmark. Through Dialcom's XMAIL service users have the option of sending electronic mail to any of the more than 200,000 public telex terminals in the U.S., and more than 1.8 million overseas. The Dialcom service also interfaces with TWX, MAILGRAM, and CABLEGRAM.

In early March 1986, British Telecom, a leading telecommunications company, signed a letter of intent to purchase Dialcom from ITT Corporation. As of this writing, the sale was still pending—British Telecom had 60 days in which to complete an audit of Dialcom. Should the sale go through, Dialcom's services would remain largely unchanged, according to a spokesperson.

RESOURCES AND FACILITIES

Processing Center

ITT Dialcom maintains operations centers in Silver Spring, MD and Whippany, NJ. The major hardware components of ITT Dialcom's computer operations include:

- Prime 550/750/850/9955 computers
- 4471 300MB Disk Subsystems and Burst Mode Controllers
- 4476 315MB Fixed Media Disk
- 4522 Magnetic Tape Subsystems (9 Trk, 1600 bpi, 75 IPS)
- 4550 Mag Tape Subsystem (9 Trk, 6250 bpi 75 IPS)
- 5154 HP AMLC RS-232-C, 16-line Controllers
- 7041 Primenet Node Controller
- 5602 Synchronous line controllers with Bisync and HDLS options)
- 8440-P/8450 Primenet Software (X.25 Packet Network Interface)

Systems Software

ITT Dialcom uses a customized version of the Primos operating system on its host computers. The applications software for specific products, such as electronic mail and electronic publishing, are written in Fortran and Fortran 77, although some new products are being developed in the PL/1 and C languages.

▷

ITT Dialcom, Inc.

▻ Customer Support Services

Dialcom's support organization strives to properly introduce users to office automation concepts and applications. Each installation is tailored to the specific needs of the client (for example, Dialcom will create customized menus). In addition, Dialcom will send members of its training and consulting teams to the users' site to introduce office systems and explain system applications. Training can be given in a classroom, in individual sessions, or to the client's own team of instructors.

Dialcom's client consultants also provide services in other areas, such as terminal selection, special software needs, communications, database management design, and any other computer-related office need.

Sales and Marketing Services

Dialcom maintains marketing branches in New York, NY; Waltham, MA; Des Plaines, IL; Washington DC; San Francisco, CA; and Houston, TX. Dialcom reports that its marketing support staff outnumbers its sales staff by a ratio of two to one.

System Security

ITT Dialcom's computer system is protected by a variety of security features, including hardware, software, and physical protection measures. These precautions protect both the overall integrity of the system, and the individual user's access to the system. In addition, Dialcom has developed proprietary features that enhance its security.

Some of the major nonproprietary features of Dialcom's system include:

- Automatic line disconnect, to prevent random access
- Access virtual control panel via software only, to prevent physical access to the PRIME hardware
- Key software maintained separately from user access
- Encryption of all password information
- Time and day of last login display for each new login, to alert users of possible illegal access
- User capability to change personal password as frequently as desired
- Periodic test for "familiar" passwords
- Console log of all illegal login attempts, monitored periodically to detect the effort of a personal computer attempting random passwords
- Access to electronic mail is restricted to a message recipient; not even a member of the Dialcom staff can access a user's mailbox
- Private message confidentiality option through use of a message-specific password
- Password length flexibility (up to 30 "alpha" characters)
- Password expiration every 60 days

PROCESSING SERVICES

Pricing

Dialcom's normal hourly rate is $15.50 to $19.00/prime business hours; $10.50 nonprime. For additional pricing information please contact Dialcom directly.

APPLICATION-SPECIFIC SERVICES

Dialcom considers electronic mail to be the hub of its Automated Office Systems. Its electronic mail system is integrated with other international and domestic communications services, including Telex I/Telex II (TWX), Mailgrams, and Telegrams. Additional communications systems include bulletin boards (both public and private), teleconferencing, and interterminal "chatting."

Electronic Mail

Dialcom, one of the earliest entrants in the electronic mail market, developed its system in the mid 1970s. Like any electronic mail system, Dialcom's offering uses a computer to process person-to-person communications, permitting instantaneous, around-the-clock transmissions of most forms of office communications. Users access system functions via plain English commands. Conversations, reading, filing, retrieval, posting, and updating of intra- or interfacility messages can be transmitted. A HELP command provides tutorial guides when requested. Automated distribution lists and text editing capabilities also enhance message transmissions.

As previously mentioned, Dialcom has integrated its electronic mail service with other communications services. These services include:

- *WPMAIL*—a special program that allows noncompatible word processors to "talk" to one another. As such, it will transmit "clear" text, from, for example, a Lanier diskette to a Wang. Additionally, if the communicating word processors are "like" terminals using identical codes for tabs, underlining, etc., this information can also be exchanged.

- *PCMAIL*—a PC-based mail transfer system that enables users to send mail messages created off-line on a PC through the Dialcom mail service to other users.

- *Telex Interface*—can be used to add over a million delivery locations around the world for Telex Messages, Mailgrams, Cablegrams, and Telegrams.

Electronic Bulletin Board

Subscribers can post announcements, policy and guidance statements, job openings, and other information. Users may respond directly to the individual or post the response on the system. ▻

ITT Dialcom, Inc.

Electronic Publishing

With Dialcom's E-PUB software, users can create their own electronic publishing center to publish newsletters, press releases, technical or financial reports, and product or service bulletins. The system is capable of permitting or restricting information accessibility on a person-by-person basis. In addition, the system is custom-tailored to provide easy-to-use menus with options for scanning headlines or titles, reading items in their entirety, or full text searching. Another feature permits users to create a personal file of search terms. When data is loaded into the system and it matches the profile, the system automatically mails the items to the user's electronic mailbox.

File Transfer Services

FT—a file transfer service that allows users to transfer both single and batch files between PCs and the Dialcom on-line system. The service interfaces with the Dialcom mail service and it works with the selected communication package. FT provides error detection and correction for the transfer session.

FT is compatible with popular communications packages. Currently, FT supports XMODEM protocol, and the YMODEM protocol is scheduled as a 1986 offering.

XMIT—a file transfer service that allows users to transfer ASCII text files between a PC or word processor and the Dialcom on-line system.

Executive Calendar System

Dialcom's calendar system enables users to scan the schedules of up to 15 people at once; display open time slots; check the availability of the conference room or slide projector; and place a meeting in all schedules—all with a single entry.

Scheduled items can be tagged as Accepted, Tentatively Accepted, Pending, Declined, Cancelled, or just a Reminder. Changes in status, date, time, or appointment details, such as room changes or attendee lists, can be easily made.

Phone Message System

Receptionists can use this system to enter electronic phone messages when calls are received. In addition to the message details, an electronic "While You Were Out" slip details when the call came in, and who took it.

The system can also function as an "electronic rollodex."

Word and Text Processing

The word and text processing system provides capabilities for text input, editing, and formatting, and includes a 56,000-word dictionary for spelling verification. Other system features include simple commands for global changes, insertions, deletions, margin justification, and paragraph repositioning.

Database Management System (INFOX)

Dialcom's database management system offers data entry, update, query, and computational capabilities for information entry, update query, and report writing. It features plain English commands, data dictionary to define file structure, formatted screen development, user-oriented menus, and prompting. Other features include on-line updating, simultaneous file access for transactions, query-type information selection, report generation from multiple files, and sorting capabilities. The system manages:

- Business systems, such as inventory, order entry, accounts payable, and accounts receivable
- Tracking systems for correspondence, grants and loans, procurement, profiles, and competitive data
- Personal systems, such as corporate and individual directories, expense reports, and logs

Correspondence Management

The correspondence and list management system provides tools to automate tasks associated with the production of mailing lists, letters, envelopes, labels, postcards, and directories. Mailing list management facilities include automatic merging, matching, and name search functions to prevent duplication. Mass mailings and correspondence tracking, filing, and retrieval are also accommodated.

NETWORKING SERVICES

Dialcom operates an asynchronous and synchronous X.25 computer network, which can support more than 1,200 simultaneous users. The network offers 600 local dial-up 300/1200-baud asynchronous lines either connected to its processor directly or through its X.25 network. The Dialcom network is accessible, with the appropriate logon ID and password, from any type of ASCII terminal.

Dialcom is also accessible through Telenet, Tymnet, and Uninet, with nationwide access available at any nodes of those Value-Added Networks (VANs). Consequently, if the user's local node is down, he or she has the option of using another route to get onto the system.

ON-LINE DATABASES

Dialcom offers a number of information products that are in keeping with the interests of its target market—Fortune 1000 companies. These products include electronic newswires, travel services, and bibliographic databases. Most of the databases described below are profiled in the On-line Databases Tab (OL40) in Volume 1 of this Directory.

Dialcom also offers a gateway link that enables users to establish a connection to any computer system accessible through the public data networks. Commercial and public database vendors that Dialcom is capable of gatewaying to include DIALOG, Systems Development Corporation (SDC), Bibliographic Research Service (BRS), and I.P. Sharp Associates Limited.

▷

ITT Dialcom, Inc.

▷ **Agriculture**

USDA Online—features news about USDA policy and program decisions relating to such areas as farm programs, agricultural exports, agricultural and food research, food inspection commodity grading, forestry, food stamps and school lunch programs, and soil and water conservation.

Business and Management Information

ABI/Inform—provides worldwide coverage of business and management information appearing in more than 650 publications. The database consists of 200-word summaries (abstracts) of the principal articles appearing in leading business journals.

Daily Tax Report—offers up-to-the-minute information on business accounting and tax news. It is produced by the Bureau of National Affairs.

SEC Advance—contains the full text of the daily Security and Exchange Commission's News Digest; it is produced by the Bureau of National Affairs.

News

Electronic News Service—provides electronic access to United Press International (UPI), the Associated Press (AP), Deutsche Press Agentur (DPA), the OPEC newswires, and *USA Today Update.* In addition, the latest stock market and commodities exchange quotations are available through the *Unistox* financial newswire, and 15-minute delayed stock quotes are available from Bunker Ramo Information Systems.

As an adjunct to its electronic news service, Dialcom offers an electronic clipping service, dubbed *News-Tab.* This service enables users to create a personal index of up to 25 key words and phrases. The program then continuously searches the news wires and automatically deposits all stories containing those key words into the user's electronic mailbox.

Travel

Official Airline Guide—provides information on more than 820,000 direct and connecting schedules from/to more than 105,000 domestic and international locations. OAG details information on departure/arrival, connections, type of meal service, and aircraft and fare options to or from a particular place. Full information is also available regarding special rate fares, such as "Super Savers."

EAASY SABRE—provided by American Airlines, offers access to domestic and international airlines, fares, and schedules; also permits users to book airline, hotel, and car reservations on a worldwide basis.

Miscellaneous

Dialcom also provides access to the databases offered by *Dow Jones News/Retrieval.* These databases include current and historical stock market quotes, profiles of major U.S. companies, a stock symbol directory, a weekly economic survey, and electronic transcripts of the *Wall $treet Week* television program.

OTHER PROFESSIONAL SERVICES

ITT Dialcom offers consulting services in systems analysis, design, and development. Dialcom's program analysts use a variety of languages, including Basic, Fortran, PL/1, Cobol, and Pascal.

FUTURE PLANS

Dialcom has played a key role in the development and implementation of the CCITT standards (known as X.400) for electronic mail, adopted in October 1984. The ITT subsidiary is currently developing the software necessary to implement this standard, which will allow for interconnections between electronic mail systems.

Dialcom also plans to offer an enhanced forms capability, as well as more informational databases. □

Martin Marietta Data Systems

Martin Marietta Data Systems, an operating company of Martin Marietta Corporation, offers packaged software and other computing services. In the software arena, the company provides applications, productivity, decision support, and workstation software for end users and computer specialists. The company also offers computing, professional, and facilities management services as well as systems integration.

Martin Marietta Data Systems remote computing applications are geared to manufacturing; business systems, including financial, accounting, and administrative systems; human resources; engineering and science applications, as well as management sciences, mathematics and statistics; and transportation.

Formed in 1970, Martin Marietta Data Systems serves business, industry, government, and financial institutions worldwide.

COMPANY INFORMATION

Martin Marietta Data Systems
6801 Rockledge Dr.
Bethesda, MD 20817
Telephone (800) 257-5171

Company Background

Created in 1970, Martin Marietta Data Systems provides information management solutions through software products and services that address real-world application needs in industry, government, business, and finance. Martin Marietta Data Systems is part of Martin Marietta, a technology-intensive corporation that designs, manufactures, and integrates systems and products in the fields of aerospace, defense, electronics, information and data management, energy, and materials. The company employs more than 5,400 worldwide, and has four commercial divisions. These divisions include:

- *Information Technology*—commercial packaged software and related software.
- *Systems Integration*—provides large-scale integrated systems and facilities management to government and commercial markets.
- *Hoskyns Group, Ltd.*—the United Kingdom-based computer services company.
- *Accounts*—provides information processing services to the Martin Marietta Corporation.

Martin Marietta Data Systems had revenues in excess of $430 million for its most recent fiscal year.

RESOURCES AND FACILITIES

Processing Centers

Martin Marietta Data Systems' major host facility is located in Orlando, FL. It is one of the largest commercial computer installations in the United States. In addition, Data Systems has three data centers in the United Kingdom.

Nationwide data communications services link to the data center from 11 locations throughout the United States.

Several communication modes are available that offer great flexibility to the user. They include dedicated terminals connected to network nodes strategically placed throughout the country, and dial-up, which includes local concentrator and value-added networks.

The Data Systems' computing facilities also support a wide variety of portable and stationary terminals.

Equipment at the company's data centers includes the following:

- Multiple 3084, 3033, and 43XX CPUs
- IBM 3350, 3380, 3330 Models I and II storage devices
- 7- and 9-track tape drives with storage densities of 800 to 6250 bpi
- Multiple remote and local communications concentrators

System Software

OPERATING SYSTEMS: In addition to IBM's OS/MVS/XA and VM/CMS, the primary operating systems used by Data Systems include the following:

- TSO
- Wylbur
- RACF
- JES 2
- CICS

DATA MANAGEMENT: As a national computing services vendor, Data Systems provides the use of the following data management systems:

- RAMIS II
- System 2000
- IMS

▻

- IDMS
- Total
- CICS
- Model 204

RAMIS II is a database management system designed for end-user computing, decision support, and sophisticated applications development. Composed of more than 20 integrated components, RAMIS II provides storage and retrieval of data in RAMIS II databases, plus read-only access to sequential, ISAM, and VSAM files, as well as IMS, DL/1, TOTAL, ADABAS, and IDMS databases. RAMIS II offers advanced artificial intelligence-based technology through its English processing component for easy end-user computing and the RAMIS II Reporter fourth-generation language for report writing. The new DBM database manager component of the basic RAMIS II system allows the effective use of large databases in production applications. Other features include a formatted screen manager and relational capabilities.

RAMIS *II English* allows the user to communicate with the computer in normal, conversational English, providing easy access for data processing novices. English is easily integrated as the "front end" to many of Data Systems' applications software products.

PROGRAMMING LANGUAGES: Data Systems offers the following programming languages:
- Assembler OS/VS
- VS Basic
- Cobol Interactive Debug
- Fortran Interactive Debug
- APL
- APT
- PL/1 Checkout Compiler
- PL/1 Optimizing Compiler
- ANS Cobol Version IV Release 1.4
- ANS Cobol V3 (DOS)
- ANS Cobol V3 Library (DOS)
- Cobol VS
- DOS/VS Cobol
- Fortran IV G1
- Fortran IV H-Extended V2.2
- Fortran-VS (1977 STD)
- Assembler H

PROGRAMMING AIDS: Data Systems offers the following program development aids:
- IPF—Interactive Programming Facility
- FSE—Full-Screen Edit
- Cobol Interactive Debug
- PL/1 Checkout Compiler
- FDR—Fast Dump Restore
- Fortran Interactive Debug
- ADR—Librarian
- Panvalet
- IBM Utilities
- Capex Optimizer
- Abend-Aid

UFO/Cobol, a high-level, ANSI Cobol-based application development system, supports the Cobol programming effort in a CICS/VS environment. The basis of the product

Figure 1. Martin Marietta Data Systems on-line command center which tracks the status of customer problems and needs. Personnel are available seven days a week, 24 hours a day.

is a language consisting of standard ANSI Cobol statements with powerful natural extensions to handle the complexities and requirements of the on-line environment. UFO/Cobol enhances the Cobol programming effort under CICS with:

- A conversational approach to programming
- A pseudo-conversational mode of executing a Cobol program
- The support of all CICS I/O facilities using standard ANSI Cobol extensions
- An interactive screen "PAINTing" facility that eliminates the need to separately assemble BMS maps
- All 3270 screens treated as ordinary records in the Cobol program
- Handling of all 3270 attributes

Customer Support Services

Data Systems has a full-time customer service staff experienced in computing and communications operations. This staff provides customer start-up assistance, problem resolutions, and other services that may be needed to effectively use the Data Systems network.

This customer service organization is backed by specialists in communications, systems software, database management, and application systems who are available to assist customers with unusual or highly technical requirements.

The emphasis of the customer service organization is on problem prevention through effective communication, understanding, and planning.

Martin Marietta Data Systems operates an on-line command center that tracks the status of customer problems and needs (see Figure 1). Personnel are available seven days a week, 24 hours a day.

Typical Customer Profile

Data Systems provides data processing services for hundreds of customers throughout the United States, and currently serves a wide variety of organizations, including government agencies, financial institutions, commercial and industrial manufacturing, and wholesale and retail sales. Typical services include remote batch processing, as well as interactive computing, and, in some cases, data entry services. They utilize one or more Data Services database management systems, as well as the company's consulting services.

Sales and Marketing Services

Data Systems' marketing strategy is to provide cost-effective solutions to customer problems using computing services, application systems or software products, professional services, or any combination of these. Martin Marietta Data Systems has more than 6,000 product installations, plus distributors in North America, Europe, Australia, South America, and in the Middle and Far East. To accomplish this strategy, Data Systems maintains sales offices in the locations shown in Table 1.

PROCESSING SERVICES

Data Systems Performance Data

AVAILABILITY: The on-line services are available 24 hours a day, seven days a week.

RESPONSE TIME: Interactive response time (TSO) is warranted at 3.0 seconds, 95 percent of the time. Data is available to show actual average response at 1.79 seconds, with 99.5 percent at 5.0 seconds or less.

BATCH RESPONSE: This function is offered on a five-level priority class system related to the user's desired requirements. The priority service classes are:

- Class Q = 15 minutes
- Class O = 1 hour
- Class T = 2 hours
- Class G = 4 hours
- Class K = overnight

Batch response time is measured from job submission to start of execution. Data Systems warrants that these times will be met 95 percent or more of the time under all conditions.

TURNAROUND TIME: Turnaround time is usually defined as being from job submission to job purge. Job resource requirements, such as the number of job steps, CPU time, print volumes, etc., are user-designated. Therefore, Data Systems does not warrant turnaround time.

APPLICATION-SPECIFIC SERVICES

Although Martin Marietta Data Systems emphasizes its remote computing services for industry-specific applications such as manufacturing, human resources, and general

Atlanta, Georgia
Baltimore, Maryland
Barcelona, Spain
Basel, Switzerland
Boston, Massachusetts
Buenos Aires, Argentina
Calgary, Canada
Caracas, Venezuela
Chicago, Illinois
Cleveland, Ohio
Dallas, Texas
Denver, Colorado
Dusseldorf, West Germany
Frankfurt, West Germany
Greenbelt, Maryland
Haifa, Israel
Hamburg, West Germany
Hartford, Connecticut
Hasbrouck Heights, New Jersey
Helsinki, Finland
Hong Kong
Houston, Texas
Johannesburg, South Africa
Kingston, Jamaica
London, England
Los Angeles, California
Lyons, France
Madrid, Spain
Melbourne, Australia
Milan, Italy
Montreal, Canada
Munich, West Germany
Nagoya, Japan
Netherlands
New York, New York
Orlando, Florida
Osaka City, Japan
Oslo, Norway
Ottawa, Canada
Paris, France
Philadelphia, Pennsylvania
Princeton, New Jersey
Puteaux, France
Roma, Italy
San Francisco, California
Sao Paulo, Brazil
Seoul, Korea
Singapore
St. Louis, Missouri
Stamford, Connecticut
Stockholm, Sweden
Sydney, Australia
Tel Aviv, Israel
Tokyo, Japan
Toronto, Canada
Wellington, New Zealand

Table 1. Martin Marietta Data Systems sales offices.

business (as described below), the company also provides a wide variety of services in business and scientific applications. These include civil, electrical, mechanical, and structural engineering; graphics and plots; logistics; industrial engineering; mathematics and statistical analysis; project planning and management; simulation and management science; and other special purposes, including a hazardous materials system, an interactive instruction system, a solar data bank system, an urban transportation planning system, a photocomputer typesetting system, and a work breakdown plotting system.

Application Software

MAS-Manufacturing

A modular system, MAS-Manufacturing addresses the following manufacturing functions: master production scheduling, inventory control, manufacturing or shop floor control, and engineering control. For process-related industries, with lot tracking and lot traceability with quality control capabilities, another module, Material Lot Tracking, is available.

Modules can be implemented individually, sequentially, or totally. There is no need to modify installed modules to incorporate new ones. The following modules are available.

Master Production Scheduling—serves as the "build plan" to drive the materials management system. It directs and controls the manufacturing operation from production plan to shipment. Three fundamental tools simplify the master production scheduling process:

- *Production planning* establishes an overall rate of production.
- *Master scheduling* determines the most effective production schedule required to meet the production plan, identifying possible imbalances and modifying as necessary.
- *Resource requirements planning* checks the feasibility of the master production schedule, evaluating its potential impact, not only on bottleneck work areas, but also upon other critical business resources, such as investment dollars and engineering.

Inventory Control—enables managers to achieve tight control over inventory, yet recognize and react quickly to changing replenishment priorities. To maintain optimum inventory levels, inventory control includes:

- *Material requirements planning* to balance inventory levels with demands for parts and products, and to develop appropriate purchasing and production plans.
- *Inventory maintenance* to record issues and receipts of inventory against purchasing and production orders.
- *Inventory management* to help predict and track each part's demand pattern and establish appropriate order and safety stock policies.
- *Order management* to maintain up-to-the-minute status for all supply and demand orders, to provide a visual reference to inventory allocations of finished goods, and to intermediate manufactured and purchased items.
- *Inventory accounting* to provide the transactions necessary to interface with related financial systems, and to analyze current inventory investments.

Manufacturing Control—systematically schedules production work loads to eliminate bottlenecks and lessen queue times. Six key elements support the manufacturing control function:

- *Order release* provides the connection between the planning and implementation phase of manufacturing.
- *Production scheduling* develops operation-by-operation schedules for each shop order, compressing its move and queue times as required, as well as printing prioritized dispatch lists for each production work center.
- *Capacity requirements planning* reports long- and short-term imbalances between work centers' capacity and load levels, and analyzes the impact of potential changes made to remove these imbalances.
- *Shop floor control* collects pertinent shop floor data and analyzes it to monitor the progress and efficiency of orders as they progress through the shop.
- *Input/output reporting* provides a comparison of planned versus actual flow through work centers.
- *Performance reporting* produces performance reports to measure machine utilization and production efficiency.

Purchasing Control System—automates many of the tasks of the purchasing department and frees buyers from tedious duties so they can devote their skills to critical functions like unusual deliveries, pricing, and scheduling negotiations. The system provides:

- Requisitions generated automatically through the inventory control system, or entered manually
- Printed purchase orders for both direct and indirect materials, including single delivery and blanket purchase orders, produced by the system
- Critical material tracking capability from vendors through receiving, inspection, and stores
- Key reports on purchase order status and on pending receipts, future cash commitments, vendor delivery performance, and purchase price variances

Cost Control System—manages information concerning the value of stores and work-in-process inventory. The cost control system provides:

- Cost standard selection—annual and current standards are available
- Cost build-up capability providing a step-by-step review of material, labor, and overhead costs accumulated throughout the manufacturing process
- Detailed inventory cost comparison between new and prior year's costed value to analyze the inventory increase or decrease
- Work in process valuation showing costs accumulated through the current operation
- Production and purchase material variance reports showing differences in expected and actual incurred costs due to routing, efficiency, rate, and raw material substitutions
- Closed order analysis allowing detailed review of the manufacturing activity on each order as it is completed

▷ **Engineering Control System**—serves both design and engineering functions in providing access to information needed to describe component relationships, steps, and processes used in the manufacturing cycle. It enables the user to perform:

- Product structure entry and maintenance to account for all components required in an item's bill of material, along with vital data concerning changes and component effectivities
- Routing data entry and maintenance to assure that the most current step-by-step operations data used in the manufacture or assembly of each part is available
- Process and tool information maintenance to maintain current tool usage and virtually unlimited instructional or descriptive data about manufacturing processes and methods
- Where-used inquiries, so that critical information concerning component parts, work centers, tools, processes, and their complex relationships can be easily accessed

Material Lot Tracking—the version of MAS-Manufacturing for process and related industries provides an on-line, integrated solution to the unique needs of those industries closely regulated by the Food and Drug Administration (FDA) and other related industries. The system focuses on material tracking, lot traceability, and quality control to assist in regulatory compliance and ensure necessary controls.

Each function of MAS-Manufacturing is fully integrated to provide lot control and traceability in all function in which it is needed. Through the full integration of the system's modules and their databases, a single transaction provides information to all appropriate functions of the system, thereby eliminating unnecessary paperwork and increasing both direct and indirect labor efficiencies.

The MAS-Manufacturing software can be integrated with other MAS software available from Martin Marietta Data Systems including financials, human resources, and decision support.

MAS Financials

Martin Marietta Data System's *MAS-Financial software* includes eight modules: general ledger, accounts payable, accounts receivable, fixed assets and depreciation, customer order processing, sales history, purchase order and receiving, and inventory management. These modules can be installed individually or in small groupings, or can be installed as a completely integrated system in combination with other MAS application software.

- *General Ledger*—provides flexible, multiple-company, general ledger processing and tracking, and financial position statement and analysis. The system maintains records by accounting period for as many past years as desired, and permits definition of detailed accounts for the coming year. Multilevel account numbers permit the designation of profit or cost centers, divisions, or departments, and complete chart of accounts maintenance is provided. Multiple companies can be consolidated into one general ledger.
- *Accounts Payable*—handles interactive entry, editing, and processing of payables. Additionally, data entered in order to pay vendors is retrievable in a wide variety of standard reports allowing forecasting of cash requirements, open item checking, and vendor analysis. The system also has the capability of maintaining data by line item for any number of past years desired, and allows definition of accounting periods for a coming year. The system conducts invoice validation against purchase orders, and the recurring voucher feature handles regular payables such as rent, mortgages, or other loan payments. Accounts Payable can be interfaced with MAS-Financials General Ledger system.
- *Accounts Receivable*—designed to handle interactively all of the functions associated with receivables. The inquiry capability allows immediate access to information on open items for any customer. A wide range of statement frequencies is available to fulfill the need for each customer. Finance charges may be calculated automatically or entered manually. Reminder notices can be automatically selected and generated for any minimum balances specified. A salesperson's file is maintained interactively and includes a table of customer types and corresponding commission percentages. Tax and terms codes are maintained to permit automatic calculation of discounts and sales tax. Accounts Receivable can be interfaced with MAS-Financials General Ledger system.
- *Fixed Assets and Depreciation*—handles the basic accounting functions for asset acquisition, asset retirement, and the periodic calculation of depreciation. Multiple reporting entities may be maintained in separate books. Base information maintained on each asset includes number, description, acquisition date, general ledger account number code, first-year bonus depreciation and expense amounts, and retirement code. Assets can be tracked through transfers to other locations, and ITC eligibility amount, percent originally available, and recapture amount are maintained. Through the inquiry function, complete information on any asset can be obtained on-line. The depreciation comparison capability is also a valuable management "what if" decision support tool.
- *Customer Order Processing*—handles the entry, processing, picking, and invoicing of customer orders. On-line credit checks can be performed, and selective and partial billing are accommodated. The system supports distribution from multiple warehouse locations, consolidates orders, and allows drop shipping and blanket orders. Order acknowledgements can be printed. The mass price change capability speeds processing and reduces risk of pricing errors. New customers are added to the customer file as their orders are interactively entered during processing. Customer Order Processing can be interfaced with MAS-Financials General Ledger, automatically posting cost-of-sale information.
- *Sales History*—permits on-line inquiry and printing of sales history in various forms. Sales history can be presented in the form of analyses, comparisons, and detail reports. Data is automatically posted into the sales history files by the customer order processing module; however, the user may add, change, or delete transactions ▷

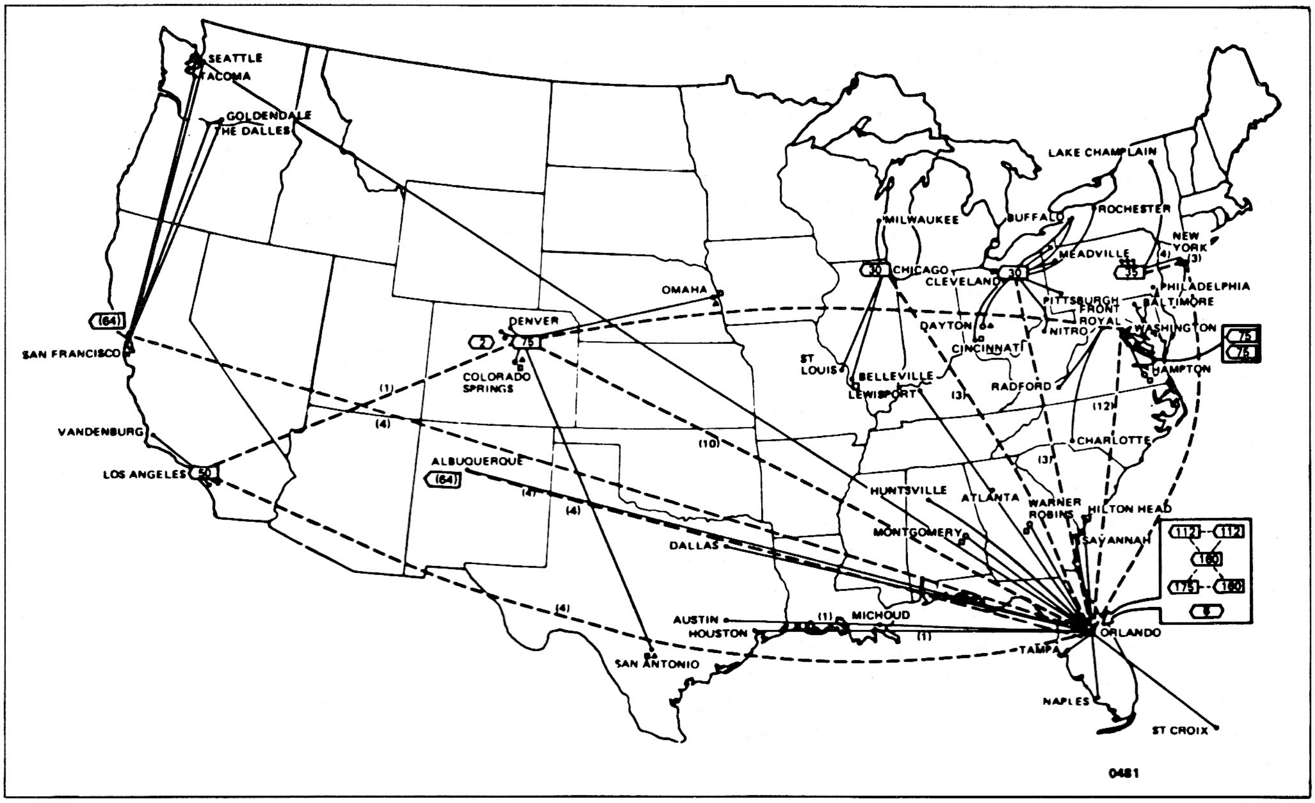

SEATTLE
TACOMA
GOLDENDALE
THE DALLES
SAN FRANCISCO
(64)
VANDENBURG
LOS ANGELES
50
DENVER
2
75
COLORADO SPRINGS
OMAHA
ALBUQUERQUE
(64)
(1)
(4)
(10)
(4)
(4)
DALLAS
AUSTIN
HOUSTON
SAN ANTONIO
MICHOUD
(1)
(1)
LAKE CHAMPLAIN
MILWAUKEE
BUFFALO
ROCHESTER
NEW YORK
(4)
(3)
MEADVILLE
35
30
CHICAGO
CLEVELAND
30
PHILADELPHIA
PITTSBURGH
BALTIMORE
FRONT ROYAL
NITRO
WASHINGTON
75
75
DAYTON
CINCINNATI
ST LOUIS
BELLEVILLE
LEWISPORT
(3)
RADFORD
HAMPTON
(12)
CHARLOTTE
(3)
HUNTSVILLE
ATLANTA
WARNER ROBINS
HILTON HEAD
MONTGOMERY
SAVANNAH
112
112
160
175
160
8
ORLANDO
TAMPA
NAPLES
ST CROIX
0481

Figure 2. The Martin Marietta Data Systems nationwide network.

through interactive processing. Information from former systems can therefore be entered for comparison purposes. Data from sales not invoiced through customer order processing, but entered directly through accounts receivable is also accommodated.

- *Purchase Order and Receiving*—creates and records purchase order activity. Purchase orders may be entered and kept on file until ready for release, and blanket purchase orders may be set up to take advantage of lower prices. Multiple releases for blanket orders are accommodated. All purchase order data may be interactively modified or deleted before printing. On-line inquiry may be performed using the vendor number, or by entering a part of the vendor name. Inquiry may also be based on item and vendor number. The system includes several decision-support features, including vendor performance analysis and cash requirements projections.
- *Inventory Management*—a comprehensive tool for the management of both manufacturing and distribution inventories for multiple companies in multiple locations. Item files contain base information such as number, description, quantity on-hand and on-order, and default pricing. Management data in the file includes recommended and economic order quantities, safety stock, and customer service level. Additionally, the file contains manufacturing data such as inventory class, status code, and cycle count code. Exception usage reporting indicates those items within a selected class whose actual usage varies from forecasted usage by a user-specified percentage. Inventory issue, receipt, and transfer transactions are easily accomplished. Recalculation is done automatically at the end of each period for average usage and reorder levels. Current information on any item is continuously available on-line.

MAS-Human Resources

MAS-Human Resources is a comprehensive, integrated system that enables human resource executives to effectively manage in today's rapidly changing economic and regulatory environment. MAS-Personnel eliminates the need for manual creation and maintenance of personnel records and files. MAS-Payroll automates virtually every aspect of payroll accounting from check generation to all required tax forms.

MAS-Personnel system supports the maintenance of a wide range of critical employee information and generates reports in the following functional areas:

- Profile/career history
- Applicant reporting
- Benefits administration
- Government regulatory reporting
- Work Force planning
- Training/skills inventory
- Wage administration

MAS-Payroll system maintains critical employee data to permit tracking and reporting in the following functional areas:

- Employee payroll profile
- Payroll processing
- Payroll reporting

Martin Marietta Data Systems

- Bank reconciliation reporting
- Government reporting

MAS-Decision Support

MAS-Decision Support is created from the synergy of two Martin Marietta Data Systems product lines, MAS application software and RAMIS II. By integrating the MAS application software with the decision-support capabilities of RAMIS II, a new decision-making arena has been extended into the operational capabilities of applications systems.

Multiple levels of information retrieval are designed to accommodate the various levels of technical sophistication required to access information. For the computer novice, MAS-Decision Support offers menu-driven inquiry and reporting to guide users through the retrieval of information giving the new user the ability to generate on-line or printed reports. For the busy executive, artificial intelligence components provide on-line access through natural English inquiry with no knowledge required either of the reporting language, or how the data is stored. For the more technically sophisticated user, the nonprocedural, English-like syntax of RAMIS II makes it simple to extract data from any MAS database, combine and manipulate the data, and format the information for either on-line screen viewing or printed reports.

The MAS family of products designed for the manufacturing industry sector are compatible with a wide range of hardware platforms including:

- IBM Mainframes
- IBM 4300 Series Computers
- Digital Equipment Corporation-VAX Minicomputers
- HP-3000 Minicomputers
- Martin Marietta's Remote Computing Services

Strategic Architecture

Martin Marietta's *Strategic Architecture* is the foundation for future application software development. Strategic Architecture design concepts provide the means for insulating the applications business function from the technical environment in which it operates. The benefits include increased programmer productivity; decreased maintenance costs; protection of software investment against future technological change as software can easily be transported to new hardware and operating environments; and companies with various hardware environments in various locations can now have a single functional system to meet all their requirements.

Workstation Software

Martin Marietta's UNISON product line is a comprehensive line of integrated software products working in unison to facilitate and simplify the use of a personal computer as a workstation for word and data processing, as a mainframe terminal, and for cooperative micro-to-mainframe processing. UNISON's components are as follows:

- UNISON Workstation Manager provides easy-to-use, pop-up menus to access all software on the personal computer. It is the umbrella product of the UNISON product line.
- UNISON Decison Support products include PC/Reporter, bringing the reporting power of the mainframe to the personal computer; KeepIT, the database; CalcIT, a 3-D spreadsheet program; and ShowIT, a state-of-the-art business graphics program.
- UNISON Micro-to-Mainframe Communications products include RamLink which provides access to mainframe RAMIS II; LinkIT, a menu-driven communications link between the personal computer and the mainframe; MailIT, a personal computer tool for the IBM Professional Office System (Electronic Mail); and PC-Mainframe, a component of the CONCENSUS product line.
- UNISON Test Processing products including WritIT, a word processing package, and EditIT, a full-screen program editor.

On-line Application Development

CONSENSUS, the company's new on-line applications development system is designed to expand options for applications development. The three different programming options of CONSENSUS, which operate in multiple environments, permit planning and executing of development work in a flexible, logical manner. Martin Marietta claims that CONSENSUS is easily learned by programmers and that it conserves machine resources while allowing programmers to "create more applications than ever before." CONSENSUS offers three different applications development languages:

- CONSENSUS OPL4 is a state-of-the-art, fourth-generation language that provides a structured design for applications development. OPL4 uses machine resources with an efficiency approaching a Command Level Cobol program. OPL4 uses a high-level language to reduce coding to its basic elements. Developers can concentrate on the logic of the application, not on the logic of the programming language.
- CONSENSUS UFO, a nonprocedural, fourth-generation on-line applications development language, allows development of CICS applications and is designed to be of most use where traditional Command Level Cobol programming is the weakest. UFO's fill-in-the-blanks format allows development of programs on-line. It also enables programmers to design applications interactively, quickly, and simply, according to the company. Data is validated at the field level, automatically.
- CONSENSUS COBOL/XE is Martin Marietta Data Systems' ANSI Cobol approach to on-line programming. It allows programmers to write on-line applications in their standard, familiar language. COBOL/XE can quickly and efficiently convert existing batch programmers into CICS programmers without retraining. The company claims that COBOL/XE creates a compiled code that is efficient, compact, and extremely reliable.

▷ NETWORKING SERVICES

The Data Systems communications network passes more than two billion characters per day which consists of multiple communication concentrators, Comten 3690s and 3691s, attached to the combination of multiple IBM 3084 and IBM 3033 systems in the major host computer center in Orlando, FL. The Orlando center is interconnected to remote communication concentrators or multiplexers operating as network nodes in Baltimore/ Washington, Philadelphia, New York, Houston, Chicago, Denver, Los Angeles, Albuquerque, Cleveland, Princeton, San Francisco, and London.

The controlling software for the network is communications network software (CNS). Through the use of CNS, a port in a host concentrator or a node concentrator can be connected to any one of several mainframes using different protocols.

In addition, Data Systems provides local dial asynchronous service in most of the major cities in the United States and also provides In-WATS services for all locations in all 50 states.

Low-speed ports are enhanced by the use of automatic bit rate detection, allowing all types of low-speed terminals using different bit rates to access the same port. Terminal-initiated line switching is also supported to allow the user to select the system and application to which he/ she desires to be connected. Site-initiated line switching is supported to allow bisync users to be routed to a different mainframe without hardware rearrangement. The geographical scope of the network is illustrated in Figure 2 (page RC20-620-106).

Martin Marietta Data Systems' customers are charged for RCS/Timesharing services actually used. As a result, customer invoices vary from month to month depending on their processing load.

To stabilize customers' remote data processing costs, Data Systems offers a highly reliable, remote data center product, Orlando 4000—The Computer Condominium. This product combines the processing power of an IBM 3081 with communications, software, time-proven operational procedures, and specialized support services for a fixed monthly price.

The entry-level condominium is smaller than an IBM 4321. Larger units are available in 12 increments and range in size to the equivalent of an IBM 4381-2. Condominium capacity changes can be made with as little as seven days' notice and can be accomplished without operational or financial penalties to the user.

OTHER PROFESSIONAL SERVICES

Local Batch Services

Full batch services are provided by Martin Marietta Data Systems.

Systems Integration

Martin Marietta Data Systems provides and installs hardware (through OEM agreements), both proprietary and third party software, communications networking, and, most importantly, the support of the Professional Services personnel to assure that each customer's unique requirements are met.

Facilities Management

Data Systems performs facilities management services on an extended contract basis.

Software Package Sales

Data Systems offers a variety of software packages for sale, especially for the manufacturing sector.

Programming

The company offers contract programming and system customizing.

Training and Education

Data Systems provides a variety of training and education centers in the United States and the United Kingdom. The company also offers on-site instruction.

Consulting

Data Systems consulting services are numerous and cover a spectrum of fields.

FUTURE PLANS

Martin Marietta Data Systems recognizes that it is in a highly competitive industry; therefore, it is enhancing its product offerings and developing new and innovative value-added packages. □

▷ The *In-Charge Reporting and Payroll Accounting* system is designed for reporting efficiency. FMS-II mechanizes time reporting by storing all information—tardiness, sick leave, operators in training, those loaned to other departments—for easy retrieval. FMS-II simplifies payroll accounting and reporting by integrating all operating information. System exception processing not only records all operator assignment exceptions as they occur, but also updates individual operator activity files and daily force status summaries.

FORMNETS—provides direct mechanized distribution of precompleted service orders containing assignment data to the Network Frame and Installation and Maintenance Division. FORMNETS also prices service orders, loads and assigns service orders to appropriate field groups, and also constructs a complete productive work load for each installer. Benefits of FORMNETS are a reduction of manpower requirements, better tracking and results reporting, and increased efficiencies and service.

Computer Based Training

AIS-11—an advanced instructional system for evaluating customer training, tracking training programs, and evaluating the effectiveness of a training program. AIS-11 can reduce training time by up to 40 percent, by making more efficient use of training resources. There is also a reduction in the course development time, and a 70 percent decrease in administrative time.

Service Order Tracking

OCS-Order Control System—provides complete tracking of service orders. Also provides status reports of all orders in the system (i.e., completed, pending, missed). In addition, generates revenue, inventory, and tax reports. The reports can be used to track work by technician or location. Reports can be used to chart or graph revenue generation or promptness in servicing orders. OCS coordinates multistate order processing. Also provides easy access to archived order records.

NETWORKING SERVICES

MDCSS provides local telephone access to its systems in over 300 cities in the United States and Canada. The network has connections to GTE Telenet, Uninet, and Tymnet. Access from locations not on the network can be accommodated via direct dial.

MDCSS also offers a dedicated, private data transmission network available only to its Denver systems customers. This system, known as CSSNET, can be accessed from most major metropolitan areas.

The network employs a packet switching technology, and all data is error-checked at each "node," or central office, as it passes through the network. If the data is not received correctly, it is automatically retransmitted. Each node in the network is connected to many other nodes to assure that the data gets through without "traffic jams" caused by peak periods or faulty equipment.

Detect is a communications network trouble tracking and traffic analysis system. It allows network technicians to interactively track line trouble down to an individual circuit in a trunk group. Responsible carrier and contact information is provided so problems are quickly reported and resolved. Detect also provides network traffic analysis, an automated on-line directory, telephone equipment inventory management, and telephone usage responsibility assignment.

TELADVISE (Telecommunications Administration Visual Information System-Expandable) is a communications management system that integrates telephone administration functions with traditional data processing. It provides a customized system with modules such as utilities, toll rating, billing, traffic analysis, and management. Other functions can be developed and integrated to meet customer requirements. Electronic office capabilities, such as word processing, electronic mail, or spreadsheets, can be included in the customer's information system.

TELADVISE runs on Digital Equipment Corporation computers, and is available through time-sharing or as a turnkey system with hardware sized to customer requirements based on modules selected and processing volume. Also, a combination of microcomputer/minicomputer and time-sharing processing is available.

Tymnet—communications software for managers of large corporations who wish to communicate data among geographically dispersed terminals, PCs, and mainframe computers. TYMNET effectively manages the incompatible protocols, configurations, baud rates, and transmission models.

By using a worldwide single source communications network that is software based, the network is programmed to convert incompatible "sending" data into a form that is compatible with the "receiving" device. The benefits to the manager are: greater profit, flexibility, ease of implementation and use, freedom of choice, coverage, security, economy, versatility, better response time, reduced network management, better use of host(s), control, and autonomy.

ON-LINE DATABASES

McDonnell Douglas Communications Systems and Services, Inc. supports no on-line databases, although its clients databases are maintained on-line and are available for client processing.

OTHER PROFESSIONAL SERVICES

MDCSS also provides custom programming and contract programming from its headquarters in Denver and from its regional offices. Full-service facilities management is available, including network or dial-up access, processing, output, and technical support. □

NCR Data Services Division

The NCR Data Services Division, part of NCR's United States Data Processing Group, offers on-line information processing services to thrift institutions (savings and commercial banks, savings and loan associations, and credit unions) and retail stores. These services are provided at NCR Data Centers, which maintain state-of-the-art computer hardware systems and are staffed with professionals who perform software development, system enhancement, and customer support.

On-line services available include the STARCOM Financial System, a realtime account processing and management information system for the thrift industry; STARCOM Retail System, a comprehensive management information system for the retail industry; and the Central Information File (CIF) System, an account processing and reporting service for commercial banks. The NCR Data Services Division also provides data management services for a variety of industries.

COMPANY INFORMATION

NCR Data Services Division
1700 S. Patterson Boulevard
Dayton, OH 45479
Telephone (513) 445-4115

Company Background

Part of NCR Corporation's United States Data Processing Group, the NCR Data Services Division provides on-line services to thrift institutions, credit unions, commercial banks, and on-line and batch services to retail stores.

NCR Data Services offers three management systems, each geared to a specific industry. For the thrift industry, the company offers the *STARCOM Financial System*, a realtime account processing and management information system. The *STARCOM Retail System* is a comprehensive management information system for retail businesses. For commercial banks, the *Central Information File System* features account processing, reporting, and on-line inquiry services. NCR Data Services also offers a data management service.

NCR Corporation develops, manufactures, markets, installs, and services business information processing systems for selected worldwide markets. These markets are primarily in the retail, financial, commercial, industrial, health care, education, and government sectors. In addition to offering its well-known line of Electronic Cash Registers (ECRs) and Point-of-Sale (POS) systems, NCR offers a complete line of computer systems, ranging from small business computers to mainframes. These computer systems are supported by a broad spectrum of terminals, office automation products, peripherals, data communications networks, and an extensive library of software products. NCR employs over 60,000 people worldwide, and is a publicly held firm listed on the New York, London, and Main Swiss Stock Exchanges.

In September 1986, NCR Corporation acquired Datacopi, the largest U.S.-based image processing company. Datacopi serves all industries, with computer laser printing, computer output microfilm, electronic distribution, and other related services. Datacopi is now a wholly owned subsidiary of NCR Corporation.

RESOURCES AND FACILITIES

Processing Centers

The Data Services Division operates over 25 data centers throughout the U.S. The typical data center includes an NCR 8575 System with 6540 and 658 Disk Units, 647 Train Printers, 635 Tape Drives, and 621 Communications Controllers. The number of processors, amount of memory, and quantity and types of peripherals used depend on the number of customers the data center serves.

Customer Support Services

The NCR Data Services Division employs over 1,000 professionals to meet the needs of customers associated with the thrift institution, commercial bank, and retail store industries.

PROCESSING SERVICES

Users of the NCR Data Services are usually charged on a per-transaction or per-account basis. Typical contracts between the two parties are for a minimum of three years. Over 1,900 clients currently use NCR's data processing services.

INDUSTRY-SPECIFIC SERVICES

The NCR Data Services Division offers three application on-line services: the STARCOM Financial System, the STARCOM Retail System, and the Central Information File (CIF) System. These three systems offer services for thrift institutions, retail stores, and commercial banks, respectively.

STARCOM Financial System

Specifically designed for thrift institutions, the STARCOM Financial System is a modular package consisting of six application systems, which include the following:

- *On-line Financial General Ledger System*—provides accounting and management information through a variety of on-line inquiries and system reports. The system enables the institution to control automatic posting of

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teller-processed transactions (i.e., loan payments, savings deposits, withdrawals, etc.) to the proper General Ledger account. Automatic creation of the correct offsetting debit or credit entry is also provided. The generated General Ledger transactions are optionally consolidated to a teller, branch, or institutional level for ledger posting. Other features of the system include budget planning, on-line inquiries, maintenance transaction processing, income and expense processing, and daily, monthly, closing, year-end, and periodic system reports.

- *On-line Financial Customer Information File System*—displays complete information pertaining to an account holder, including account numbers, account balances, and names and addresses. The system also provides and maintains a complete alphabetical cross-index file of account holders' names and/or addresses.
- *On-line Financial Savings System*—provides on-line updates of the Savings Master File for statement savings, passbook savings, and many types of certificates of deposits (CDs). The system ensures accurate account processing, provides instant file updating, and generates a variety of daily, weekly, monthly, periodic, and annual reports for account holders, government agencies, and financial institutions. Interest rates are also maintained and automatically calculated and credited on savings close-out withdrawal.
- *On-line Financial NOW Account Processing System*—ensures accurate processing of clearing items, over-the-counter items, and loan payments, and provides a complete series of management reports, plus detailed statements for the account holder. Other system highlights include automatic application of service charges, the ability to place stop payment requests on-line, overdraft protection and line-of-credit loans, reporting of rejected items via on-line inquiries, and up-to-date on-line control totals for each teller.
- *On-line Financial Loan Processing*—provides periodic on-line, realtime transaction processing of simple interest, simple interest daily, and add-on/discount interest. The STARCOM Loan System accommodates the following types of loans: mortgage, installment, collateral, adjustable mortgage instruments (variable rates, graduated payment, adjustable rate), consumer, commercial, line of credit, single payment, floating rate, participations, secondary market, collection, and services. Processing features include automatic payment changes in an on-line, realtime environment, and deferred income and expense processing on a straight line, actuarial, or sum-of-the-digits basis. A complete reporting system is provided for these loan processes. In addition to the specific reports, daily transaction journals, auditor exception reports, and the associated periodic reporting for weekly, monthly, quarterly period, semiannual, and annual reporting are also provided.

Central Information File System

The NCR Data Services' On-line Central Information File (CIF) System, is an on-line memo-posting banking system designed for commercial bank account processing. CIF maintains financial data, integrating all account information for each customer, thus allowing a bank to view a customer's activity as a single entity. The fundamental system concept allows financial institutions to integrate processing functions normally associated with separate banking applications. This integration creates a complete and accurate central file of customer information and provides the capability to economically process all applications with a single computer processing system.

Two significant features of the CIF System are data entry and on-line data inquiry. Customer account transaction data is transmitted from the bank's minicomputer system on-line to an NCR data center file for updating. The processed information is then transmitted back to the bank's minicomputer for preparation of a variety of notices, customer statements, and selected reports.

A mixed item input process captures all transaction activity onto a single magnetic file. These transactions update the Central Information File, which contains all customer and application records. One series of report programs produces daily reports, journals, and notices. This single processing system reduces processing time and provides uncomplicated operation procedures. The sequence and organization of the Central Information File enables banks to offer a combined statement. The NCR CIF combined statement provides a full description of all the customers accounts. A summary of all accounts appears first on the combined statement followed by the detail for each account.

The Data Services CIF System offers commercial banks eight application modules. Bank-defined processing options for each application allow financial institutions to individually customize their account processing functions. The NCR Data Services CIF System includes the following application processing modules:

- *Demand Deposit Accounting (DDA)*—provides complete processing for regular, business, and special accounts. Optional account analysis, float analysis, and various service charge plans provide additional processing flexibility.
- *Negotiable Order of Withdrawal (NOW)*—uses the processing features of the DDA module and provides options relating to interest-bearing accounts.
- *Savings*—offers regular and golden savings with a passbook or statement, club accounts, and certificate of deposit processing. Variable interest rates are available for IRAs and certificates.
- *Installment Loans*—one of three modules dealing with loan processing. The Installment Loan Module offers discount loan and rebate processing using the Rule of 78's or straight-line method. Simple interest loans may also be processed through the Installment Loan Module.
- *Mortgage Loans*—processes mortgage loans with escrow and provides escrow analysis.

- *Accrual Loans*—consists of three divisions: simple interest installments, commercial loans, and construction mortgage loans. This module processes line of credit/commitment, participation, and dealer floor plan loans in the commercial loans, and construction mortgage loans. Mortgage loans with irregular payment schedules, such as construction loans, can also be serviced by this module. Contingent or indirect liability accounting is a vital part of this module. It maintains necessary information for several guarantor/endorser or cosigner relationships and also provides collateral control, which may be reported by customer or by collateral type.

- *General Ledger Interface*—generates general ledger transactions as a by-product of application processing. During application processing, the system posts deposits, withdrawals, payments, and other related transactions. It then updates the CIF and creates a corresponding transaction file needed to update the general ledger in a subsequent processing cycle. In this way the complete system remains in balance.

More than 120 reports are available in the NCR Central Information File System. Each application offers a full complement of reports that provide timely data in an easy-to-understand format. In addition to application-related reports, marketing and yearly information is available, such as geographic and socioeconomic customer dispersion, 1099 forms, alphabetic cross-reference, and yearly customer interest/tax notices. Special or onetime reports may be produced through the *CIF Report Generator*. The report generator is a customized reporting system designed for customer use. The generator extracts, sorts, and prints data from the CIF master file based upon user-designated criteria. This data is sorted in the sequence defined by the user and then printed in the desired format. Data can be presented in either detail or summarized form and may include totals and subtotals.

STARCOM Retail System

The NCR Data Services Division's STARCOM Retail System is a comprehensive data collection and reporting system that enables retail management to manage personnel, merchandise, and cash flow. The retail system is a modular, transaction-oriented system that processes sales, inventory, and financial data from input via POS systems and CRT display terminals. On-site printing of reports is available via an optional cable-connected printer. The system may be utilized in total or by module.

According to the vendor, the STARCOM Retail System provides timely key performance data and ratios allowing operations and management personnel to make decisions leading to improved margins, stock turns, cash flow, stock balance by store, and sales. One of the key ratios is the gross margin on inventory investment. The application modules that comprise the Retail System include the Sales Analysis and Sales Audit Module, the Inventory Management Module, the Unit Trend Module, the Purchase Order Management Module, the Merchandise Planning/Open-to-Buy Module, the Accounts Receivable Module, the Financial Reporting System Module, the Accounts Payable Module, and the Credit Authorization Module.

The *Sales Analysis and Sales Audit Module* provides retail management with information relating to sales activity by store, division, department, and class. A daily sales summary provides terminal, store, and all-store totals by transaction type. A department-by-store daily sales analysis (via CRT terminal inquiry) shows current, week-to-date, month-to-date, and year-to-date information by units and dollars. Reports generated by the system include a sales analysis report; a sales, tax, and nonmerchandise report; and a salesperson productivity report.

The *Inventory Management Module* provides gross margin performance information for retail management at class, department, division, and company levels. A detailed report of current inventory status of each classification, sales activity, profitability, and gross margin return on investment comparison between divisions, departments, and classifications is provided in the module's Retail Inventory Management Report. Other reports generated by the module are a physical inventory difference report, a merchandise stock ledger report, an open order summary report, a vendor analysis report, and a general journal listing. This module provides the user the flexibility of reformatting desired reports through the use of a report writer. It also provides a Class Ranking Inquiry Report via the CRT.

The *Unit Trend Module* provides detailed stockkeeping unit (SKU)-level inventory information via CRT terminal inquiries or system reports, enabling a buyer to detect significant trends and to easily track merchandise movement throughout the entire seasonal curve. With this module, retailers can track merchandise sales at style, color, and size levels. The Unit Trend Report by Buyer, which displays color/size information in a matrix format, is generated by the module. Management inquiries via terminals include the Unit Trend Inquiry, the Hot and Slow (Item) Inquiry, the Unit Trend Color/Size Inquiry, and the Item Locator Inquiry. This module also provides the flexibility to reformat desired reports at the unit level through the use of the report writer.

The *Purchase Order Management Module* provides complete control and accounting from the time of order through the distribution of merchandise to the selling floor. Complete reporting and CRT inquiries are available for the key areas of ordering, receiving, checking, and distribution. The system generates printed purchase orders, receiving documents, merchandise tickets, distribution worksheets, and distribution manifests. These documents are all printed via an on-site printer at the retailer's location. Key reports obtainable through Purchase Order Management are the Order Report and Voucher-Receipt Reconciliation Report. The Order Report provides status information to each buyer for their orders. The Voucher-Receipt Reconciliation Report reconciles merchandise receipts with accounts payable data. This module is completely integrated with the system's other modules.

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The *Financial Reporting System* provides management with the current financial condition of the business. Included in this module is a Trial Balance Report, an Income Statement, and a Balance Sheet. This module also features a strategic profit model. This modeling feature provides retailers with a management tool for playing "what if" with profit variables. The model calculates current and revised profit variables and displays financial results such as inventory turnover, GMROI, and return-on-net-worth. With this feature, retail management can easily and immediately examine current financial status and the revisions necessary to achieve desired results.

The *Accounts Payable Module* maintains vendor open-item and outstanding check information, which is accessible at any time for reporting, inquiry, and updating purposes. It ensures accurate recording of amounts owed to vendors, enabling management to maximize utilization of cash resources. The Accounts Payable Module provides a number of reports, including a vendor update audit, a vendor file listing, a voucher register, an aging and cash requirement report, an open payable analysis report, a check register, a check release register, check and remittance advice, a purged check register, and an outstanding checks listing. Automatic check writing and automatic check reconciliation of returned checks are two standard features of the system. As an optional feature, checks can be written on-site using a local printer. The Accounts Payable Module also offers flexibility in selecting invoices for payment, including all invoices due according to discount dates, all invoices for specific vendors, all invoices due, and individual invoice selection based on preestablished priorities.

The *Accounts Receivable Module* enables management to closely monitor accounts receivable activity, reduce past due accounts, and enforce strict credit limits, thus maintaining maximum profit from the charge sales customer base. System reports include an aged trial balance, a credit authorization report, a selective account analysis report, a collection report, descriptive and/or nondescriptive customer statements, an account activity report, and an accounts activity summary.

The *Credit Authorization Module* allows credit sales to be authorized via CRT terminals. A sale is automatically authorized if certain conditions for the account are met (i.e., under the credit limit, not past due, under referral amount, status code OK, and not a recourse account). If the conditions are not met, detailed information about the account is displayed to allow the authorizer to decide whether to manually authorize or deny the sale. If the customer does not have his or her credit card, the account can be located by entering a partial name and address through the terminal. At the end of the day, an audit listing and a statistical summary of the authorizations are printed.

The *Merchandise Planning/Open-to-Buy Module* enables merchandise plans to be automatically generated from history information maintained in the system. The plans can be subsequently adjusted via the terminal or automatically by the system. The merchandise plan is normally printed at the end of the month; however, on-demand printing is available. The report features the past 3 months and the upcoming 12 months of the plan. The merchandise plan is also displayed through the terminal for up to six months.

OTHER SERVICES

NCR's "Total Solution" approach provides for selected applications to operate the mainframe computer and a microcomputer located at the same institution—microlinks where appropriate. NCR has created a number of systems to meet the dynamic needs of the financial community.

The *STARSTREAM System* provides a powerful database management and report generating system. According to the vendor, STARSTREAM has made the PC-to-mainframe linking process extremely productive. Financial institutions are able to gather up-to-date information to analyze the data or perform "what if" modeling with the aid of popular spreadsheets. Users are also able to construct special reports or to merge data with popular word processing software. Lead-through operating instructions make STARSTREAM easy to use, and multiple security levels protect the system from unauthorized usage.

The *Asset/Liability and Financial Planning System* provides a tool for the planning, implementation, and control process for tracking the mix and maturities of assets and liabilities. This system provides a comprehensive asset/liability management and planning control model with a direct integration between mainframe files and the PC at the financial institution. Current interest rate and maturity data is downloaded from the data processing center mainframe to the PC.

The *Loan Origination, Closing, and Tracking System* was designed to make the entire loan process more productive. This system, which runs on a PC in the financial institution, automates loan processing by aiding in the pre-qualification of a buyer, streamlining the process of taking an application, preparing all disclosures and verification requests, getting all the information together for approval, and preparing all closing documents. The system also tracks warehoused loans, as well as assists in filling commitments and shipping documents to a secondary market investor. The closed-loan data is uploaded from the PC to a secondary market investor and from the PC directly to the mainframe at the NCR data processing center.

NCR Data Services also provides data management services for areas of retailing, finance, government, education, health care, and industry. The NCR Data Management Services/Datacopi group will convert magnetic tape or other input data onto easy-to-use, easy-to-store, 4-by-6 inch microfiche. Data Management Services/Datacopi features include expanded line capabilities, choice of format, selection of reduction ratios, and color-coded title lines. NCR microfiche conform to rigid standards of the Association for Information and Image Management and provide consistent quality. □

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Neshaminy Valley Information Processing, Inc. (NVIP)

Neshaminy Valley Information Processing, Inc., (NVIP), a wholly owned subsidiary of Combined International Corporation, has been offering batch and time-shared computer services since 1973.

NVIP provides generalized computer services on its array of IBM mainframes to more than 250 clients nationwide. Services are available 24 hours a day, seven days a week. Several standard IBM operating systems are available on the NVIP computers, enabling clients to select the operating environment most suited to their needs.

NVIP's clients include Union Fidelity Corporation, another Combined International Corporation company, and numerous commercial and governmental organizations. Its software offerings are not geared to any particular application or industry; rather, it offers a wide selection of state-of-the-art products, including several powerful database management systems.

COMPANY INFORMATION

Neshaminy Valley Information Processing, Inc. (NVIP)
4850 Street Road
Trevose, PA 19049
Telephone (215) 322–2285

Company Background

Neshaminy Valley Information Processing, Inc. (NVIP), a wholly owned subsidiary of Combined International Corporation, is an IBM-equipped remote computing company offering generalized time-sharing and batch processing computer services to clients nationwide. Founded in 1973, NVIP now employs more than 175 technical specialists.

Combined International Corporation also includes Union Fidelity Corporation, which uses less than 30 percent of NVIP's computing processing power. The remaining computer capacity services more than 250 commercial and government clients nationwide.

The corporate data center in Trevose, Pennsylvania has grown during the past several years. NVIP provides a number of IBM operating systems to support client needs and to expand marketing potential.

NVIP offers its clients:

- Attractive rates
- 24-hour, seven-day accessibility
- Non-preemptible service
- Full-time customer support and hotline assistance
- Full complement of TP monitors, including TSO, CMS, Roscoe, Wylbur, CICS
- Remote batch processing
- International 300 and 1200 baud capability
- Dedicated and dial-up communications supports

RESOURCES AND FACILITIES

Processing Centers

NVIP's corporate data center, located in Trevose, Pennsylvania, houses an array of IBM mainframes, which includes:

- Two IBM 3033s running MVS
- One IBM 3033 running VM
- One IBM 3081 running XA
- One IBM 3081 running MVS

All NVIP computers share peripherals and are switchable to maintain maximum service in case of equipment failure. Current data center equipment includes:

- One IBM 3081 with 32 megabytes of memory and 16 channels
- One IBM 3081 with 24 megabytes of memory and 16 channels
- One IBM 3033 UP with 16 megabytes of memory and 16 channels
- One IBM 3033 MP complex consisting of an IBM 3033 with four megabytes of memory and 12 channels, and an IBM 3033 with 12 megabytes of memory and 12 channels
- 250 IBM 3330 Mod I, 3330 Mod II, 3350, and 3380 disk drives
- Four IBM 2305 fixed-head disk drives
- One IBM 3850 Mass Storage System Model B3
- 44 IBM 3420 7- and 9-track tape drives with densities of 556, 800, 1600 and 6250 bits per inch
- IBM 1403 printers, 1100 lines per minute (lpm)
- Three IBM 3203 printers, 1100 lpm
- Four IBM 3800 printing subsystems, 13,300 lpm
- Seven Comten Communications Controllers
- One IBM 3525 Interpreting Punch
- One IBM 3505 card reader, 100 cards per minute (cpm)
- Three Documation 6501 card readers, 1000 cpm
- IBM 3705 Terminal Control Units, NCP only
- Seven International Power Uninterruptible Power Supplies, 30-minute batteries
- Three Detroit Diesel Emergency Power Generators

NVIP protects its hardware from power failures (which can cause data loss as well as hardware damage) by using several International Power Uninterruptible Power Supplies. It also uses three emergency Detroit Diesel Generators to provide virtually unlimited power within five minutes after an outage, ensuring clients a maximum of uninterrupted service.

Data security is maintained via the IBM program product RACF, as well as via user and password identification. RACF allows or denies access to system resources, depend- ▷

ing on user identification. Different administrative levels can receive different levels of access and authority.

Security measures are also in effect at NVIP's facility itself. Access to the facility and computer room is gained via magnetic key card. All employees wear photo badges and sign in and out of the building. Clients can specify which employees of theirs are to be allowed into the building. All visitors and clients not on the client security list must be escorted and must sign in and out of the building. Security guards are on duty 24 hours a day. NVIP uses a closed circuit television system with 12 cameras monitoring the computer rooms and associated areas. Four cameras are mounted on the roof to monitor the exterior of the building. The television system is continuously monitored by security guards.

NVIP's physical plant has been designed as a secure computer facility. Multiple CPUs are in separate rooms with floor-to-ceiling slab walls in between. A number of fire detection and prevention devices are in place.

Extensive plans have been established for recovery during emergency conditions. Public disk space and data critical to computer operations are backed up three times a week, weekly, and monthly. The weekly and monthly versions are stored off-site at a commercial archive vault 20 miles form NVIP as a safety measure in case of a natural disaster.

Systems Software

OPERATING SYSTEMS: NVIP supports a number of operating systems on its computers, enabling clients to access a variety of operating environments. NVIP uses IBM's MVS operating system with the System Product (SP) feature. Currently supported operating systems include:

- MVS/XA with JES2
- MVS/VS2 with JES2
- MVS/SE
- VM
- VM DOS/VS
- VS DOS/VSE

Interactive monitors supported include:

- TSO
- CICS
- Roscoe
- Wylbur
- CMS
- CP
- RSCS

UTILITIES: IBM's MVS operating system includes the full set of standard IBM utilities to perform a variety of standard services. Other NVIP-supported utilities include:

- Compaktor (CPK), a disk management utility program option to FDR, that provides disk reorganization facilities such as merging multi-extent data sets into one data set, and expanding and changing the location of the VTOC.

- A Fast Analysis of Tape Surfaces (FATS) utility program from Innovation Data Processing that certifies scratch tapes and verifies data files on tapes.

- A Fast Analysis of Tape and Recovery (FATAR) option of FATS that provides extended error recovery features for those tapes not useable under normal conditions.

- A Fast Dump and Restore (FDR) utility program from Innovation Data Processing that dumps and restores 2314, 3330, 3340, 3350, and 3380 disk packs to magnetic tapes.

- Syncsort, a fast sort/merge program from Syncsort, Inc. that replaces the IBM sort/merge products; it is fully release-independent and designed to operate in virtual and nonvirtual environments.

NVIP uses the Tape Library Management System (TLMS II) from Capex Corporation which operates as an extension of the IBM operating systems. TLMS provides a complete tape data set inventory and tape volume quality control system with on-line inquiry and update facilities for the tape library staff.

DATA AND DATABASE MANAGEMENT: NVIP supports several advanced data and database management systems. These are described below.

- *Easytrieve* is an information retrieval, file management, and reporting system from Pansophic Systems Inc. Easytrieve is used to produce reports that may be directed to a variety of output media from any number of input files, including IMS databases. Easytrieve's command language allows the user to create new files, update existing files, retrieve data from files based on selection criteria, and generate reports.

- *ADRS II (A Department Reporting System)* is a product of IBM that is designed to allow business professionals with little or no data processing experience to produce reports customized to their requirements with only a few hours of training. ADRS II is a group of computer programs that formats files in tabular row-column arrays. Data files are processed for data inquiry, data analysis, and report preparation purposes. ADRS II is a complete system for both creating and using files of information in business applications. Features of ADRS II include graphic presentation of user-selected data in print graph and bar chart formats; the printing of reports on user's terminal or high-speed printer; basic arithmetic computation; and simple user-oriented commands.

- *Focus* is an integrated information control system from Information Builders, Inc. Focus provides a full range of functions, from selection through analysis in one integrated system. The system is composed of three major

Neshaminy Valley Information Processing, Inc. (NVIP)

areas: data storage, data maintenance, and data analysis. The key to this integration is Focus' nonprocedural language, which unites all of the Focus facilities' English statements. These statements replace thousands of lines of equivalent Cobol or PL/1 program code.

Applications can be rapidly developed using the Focus language with provides the following: complete menu and screen-creation facilities; full logic and computational facilities; comprehensive transaction processing language for data entry and validation; direct processing of existing files and databases; integration of queries, reporting, graphics, statistical analysis, and financial modeling; multilevel data security; and inclusion of subroutines coded in Cobol, BAL, Fortran, or PL/1.

- *IDMS* is Cullinane Corporation's Codasyl standard network structured database management system. A comprehensive database management system, IDMS has facilities to:

  - Define a complex database structure
  - Organize physical database storage
  - Ensure database integrity
  - Provide user program access to the database
  - Protect data security
  - Provide back-up, monitoring, and other DBA functions

  IDMS is a flexible database management system that can implement databases with either a hierarchical or network structure. IDMS' network structure and many methods for gaining entry into the database provide the designer with a multitude of database design options. This hierarchical flexibility allows the user to add new data and new applications without major impact on existing applications and without the requirement for database reorganization.

  IDMS includes the following facilities:

  - A fully active, integrated central Data Dictionary
  - Schema and subschema compilers to process the actual and the application-specific views of the database structure
  - A Device Medium Control language to map the logical database structure onto the physical devices
  - A Culprit report writer
  - Checkpointing and journalizing
  - Automatic database recovery from system or application program failure
  - Concurrent multiuser updating of the database
  - Database performance monitoring

NVIP also supports several Cullinane IDMS products which are described below.

- *Culprit* is a report writer controlled by parameter cards which describe the input files and databases, along with the output report formats and any output files and databases. Extended macro facilities make it easy to code report formats and modify existing report formats.

- *On-line English* is a natural English-language query system that enables ordinary English questions and directions to be used when retrieving data from databases and performing computations on retrieved data. Single and multiple searches, sorting, output formatting, and numerous built-in functions enable convenient database queries.

- *On-line Query* is a conversational language used to produce and format ad-hoc reports from data in IDMS databases. Facilities include predefined query files, user security, automatic headings, off-line report printing, and a help function.

- *IMS DB/DC* is IBM's principle database management system. It is a large software system with facilities to define a complex database structure, organize physical database storage, ensure database integrity, provide user program access to the database, protect data security, and provide back-up, monitoring, and other DBA functions.

  IMS DB/DC is concerned with the efficient organization of data in the database and with maintaining the physical and logical structure of the database. IMS DB/DC databases are accessible through the DL/1 interface from Assembler, Cobol, and PL/1.

- *Quikjob* is a file management and report writer system from System Support Software, Inc. which offers report writer logic similar to a Cobol Procedure Division. Four input/output files may be accessed, and user-written exit routines may be supplied. Quikjob processes random ISAM files, native VSAM files, and a variety of database files including DBOMP, Total, and Adabas. IMS and IDMS databases can be processed via interfaces.

LANGUAGES: NVIP supports the following programming languages with the following compilers:

- APL
- VS/APL
- Assembler H
- Basic
- VS Cobol
- Cobol OS Version 4
- Cobol DOS
- Fortran H
- Fortran G
- Fortran G1
- Fortran H Extended
- VS Fortran
- PL/1 Optimizer
- RPG
- RPG II (under DOS)
- Pascal VS

Neshaminy Valley Information Processing, Inc. (NVIP)

▷ In addition to the language processors listed above, NVIP supports the following special-purpose language processors:

- *Cobol Optimizer* III from Capex, which produces a highly optimized Cobol object code that reduces utilization of most Cobol programs

- *Waterloo WATFIV* high-speed, fast-turnaround, batched Fortran interpreter

PROGRAM DEVELOPMENT AIDS: NVIP supports several program development aids accessible through TSO and CICS facilities, including:

- TSO interface to librarian
- TSO SPF
- TSO FSE
- TSO Assembler prompter
- TSO Cobol prompter
- TSO PL/1 prompter
- TSO Testcob interactive Cobol debugger
- TSO Fortran prompter
- TSO Interactive Fortran debugger
- TSO Superset Utilities
- CICS local and remote
- CICS interface to librarian
- CICS DMS

Customer Information Control System (CICS) is a teleprocessng monitor from IBM which controls multiple terminals associated with application programs running under CICS. CICS isolates those application programs from details of communications control, while providing screen formatting utilities, error recovery and logging, file and database access control, and resource management. CICS programs can be written in Cobol, Assembler, or PL/1.

Librarian is a source program management system from Applied Data Research, Inc. used to store and retrieve source, object, JCL, data, and text from one or more central master files. Librarian's comprehensive reporting facilities provide standard report formats, customized reports, and update activity reports. Extensive auditing and security features are provided. Simple commands are used to add, change, or delete modules; insert, delete, replace, edit, and scan records; process a group of modules by common criteria; and verify source language syntax.

Roscoe is a terminal access system from Applied Data Research, Inc. that allows easy file manipulation and conversational remote job entry and retrieval. Roscoe includes such facilities as:

- Cobol, Fortran, PL/1, and JCL syntax checkers
- Batch job output review
- High-level interactive language
- Interface to the Librarian source library manager

Wylbur is On-Line Business Systems' on-line processing system developed at Stanford University. Wylbur supports on-line program development, remote job submission, text editing, and production processing. Although similar in services to IBM's TSO, Wylbur requires fewer computing resources.

Customer Support Services

NVIP provides extensive customer support through its customer support representatives assigned to service an account for a specific client. The customer support representatives coordinate with other NVIP staff to assist in converting client systems to the NVIP system, educating and training client personnel, and installing communications and other services.

NVIP maintains branch offices for technical support in Trevose, Pennsylvania; Arlington, Virginia; and New York. These offices are staffed with personnel ready to assist client with answers to questions, requests for service, and technical problem solving.

IBM systems engineers and program support representatives assist NVIP personnel during normal business hours. A 24-hour telephone hotline service provides technical assistance to clients when a problem can be solved over the telephone.

NVIP maintains branch offices with RJE facilities in Philadelphia, Pennsylvania; Malvern, Pennsylvania; Trevose, Pennsylvania; New York, New York; Arlington, Virginia; and Cherry Hill, New Jersey.

Sales and Marketing Services

NVIP provides sales and marketing services through offices in Trevose, Pennsylvania; New York, New York; Washington, DC; and Malvern, Pennsylvania.

APPLICATION-SPECIFIC SERVICES

Mathematics and Statistics

BMDP—a series of statistical programs distributed by BMDP Statistical Software Inc. Originally intended for use by researchers in the health sciences, the BMDPs have also been widely used by researchers in the physical sciences. BMDP programs handle all levels of analytical steps. BMDP features include:

- Univariate plotting
- Bivariate plotting
- Two-way contingency tables
- Cluster analysis
- Factor analysis
- Canonical correlation analysis
- Step-wise discriminate analysis
- Multiple linear regression
- Nonlinear regression
- Polynomial regression
- Partial correlation and multivariate regression
- Multipass transformation

▷

- Nonparametric statistics
- One-way analysis of variance and covariance
- Analysis of variance of covariance, including repeated measures

ITEMRS—a product of Psychometrics, Inc. used for scoring test examinations, evaluating questionaires, and analyzing statistics of both question and answers. This product has been used by personnel departments for examination results used in hiring; educational institutions for grading and analyzing examinations; marketing research firms for evaluating questions and responses to questionaires; and by hospitals for evaluating the quality of patient care.

MPS III (Mathematical Programming System III)—a product of Ketron, Inc. MPS III is a system for creating, managing, and solving linear programming and related optimization models to determine the best allocation of scarce resources over large numbers of competing activities and operating constraints. The package provides the following:

- A memory packing scheme that loads the problem into a minimum amount of memory, saving costly I/O operations

- Novel algorithmic techniques and strategies to reduce the time to reach an optimal solution

- A database manager to help create the model, generate the database, and prepare reports with a minimum of manual intervention

SAS—a data and statistical analysis package from SAS Institute that includes a PL/1-like high-level programming language, a report writer, and an interactive color graphics capability.

For data maintenance and analysis, SAS includes the following file handling facilities:

- Subsetting
- Concatenating
- Sorting
- Match merging
- Interleaving
- Updating
- Storing and retrieving

SAS includes more than 50 procedures to perform statistical analysis that range from simple statistics to complex multivariate techniques. Statistical facilities include:

- Analysis of variance and covariance
- Correlation analysis
- Descriminant analysis
- Factor analysis
- Frequency and cross-tabulation tables
- Simple and multiple linear regressions
- Matrix manipulation
- Nonlinear regression
- Stepwise regression
- T-tests

Statistical Package for the Social Sciences (SPSS)—an integrated system of computer programs, developed by SPSS, Inc., for the analysis of social science data. SPSS enables the user to perform many types of data analysis using convenient formats. Data transformation and file manipulation procedures are provided, along with flexibility in data format. The user may generate new variables that are mathematical and/or logical combinations of existing variables; may recode variables; and may sample, select, or weigh specified cases.

Along with the usual descriptive statistics, SPSS procedures include:

- Simple correlation
- Partial correlation
- Means and variances for stratified subpopulations
- One-way and multiple analysis of variance
- Multiple regression
- Discriminant analysis
- Scatter diagrams
- Factor analysis
- Canonical correlations
- Guttman Scaling

TPL (Table Processing Language)—a product of the U.S. Bureau of Labor Statistics, Office of Systems and Standards, Division of General Systems. TPL is a computer language designed to select, restructure, cross tabulate, and display statistical data. The goal of this product is to provide the analyst with the ability to obtain tables from data without a detailed knowledge of computers or conventional programming languages.

Dynamo—a compiler designed by Pugh-Roberts Associates, and developed for simulating dynamic feedback models for business, economic, and social system. The language is designed for use by problem-oriented persons. It makes available easy-to-use computing facilities, allowing the user to focus attention on building a useful model undistracted by computer requirements.

SAS/ETS—a library of econometrics and time-series supported by the SAS system from SAS Institute, Inc. SAS/ETS is designed for time series forecasting, regression analysis, and simultaneous equation modeling. The products's features include:

- Computab, which organizes data into tabular forms, and prints row and column reports.
- Forecast, which automatically generates many timeseries forecasts
- Arima, which analyzes and forecasts univariate timeseries data via the Box-Jenkins technique
- Statespace, which analyzes and forecasts multivariate time-series data
- X11 seasonal adjustment

- Financial functions
- Procedures for estimating, simulating, and predicting linear and nonlinear system performance

Data Management

UCC Two (DUO)—a product of the University Computing Company, Duo allows execution of DOS programs on an OS or OS/VS operating system without converting DOS source code. Through the use of DUO, both DOS utility programs can be executed in an OS environment. DUO also allows for the use of many DOS facilities which are normally not functional under OS.

VPS (VTAM Printer Support)—a command processor from Levi, Roy, and Shroup, Inc., VPS is a product designed to provide the capability to print sysout (system output) datasets on low cost 3270-type printers. This package allows a user, who is not familiar with MVS or VPS commands, to control a VPS printer through the use of menu-driven panels.

IOF (Interactive Output Facility)—a product of Triangle Systems, Inc., IOF provides a comprehensive approach to the view and disposition of sysout datasets produced by MVS batch jobs. IOF can be used for the following purposes:

- Display the status of batch jobs
- Route the job output
- Display a job return code summary
- Browse through individual datasets
- Spin off copies of sysout datasets
- Release held sysout datasets
- Cancel held sysout datasets
- Modify attributes of held sysout datasets

Word Processing/Text Editing

ETC—a text processing system from Applied Data Research, Inc. It assists in the preparation, composition, and updating of text documents. Macro facilities provide automatic table of contents and indices maintenance. ETC features include:

- Move, copy, or sorting of text
- Capitalization
- Underscoring
- Justification
- Margin setting
- Numeric calculations
- Column totaling
- Conditional generation of text
- Page numbering and dating
- Section and list numbering
- Headings and footings
- Footnotes

Script—a text processing system with powerful editing features. It supports full page makeup, including text position, page numbering, and headings on output pages.

Engineering

Lorendas—a product from Ketron, Inc., Lorendas is a computer-based modeling system that handles worldwide energy market equilibrium over a long-term planning range. Lorendas simulates in engineering, process-oriented terms, the full range of operations and investments involved in supplying energy to various energy markets around the world. It takes into account the evolution of energy operations and markets, as well as their technical and geographic interdependencies. An analysis with Lorendas integrates these elements and computes the most economical combinations of investments and operations to meet world energy demands over a 25- to 30-year span.

Graphics

NVIP supports a number of graphics packages, described below.

Cuechart—an easy-to-use system for development of high-quality business graphics from Integrated Software Systems Corporation. Cuechart consists of a comprehensive assortment of preprogrammed graph and chart styles, which includes box charts, line charts, and word charts.

Disspla—a library of Fortran subroutines from Integrated Software Systems Corporation that can provide virtually any type of graphic output and can interface with any Fortran, Cobol, or PL/1 program. Disspla routines can produce graphic output in various levels of sophistication, ranging from simple plots to complex three-dimensional perspective, isometric, stereoscopic, and map projections. Disspla features include the following:

- Common axis systems, such as linear, semilog, log-log, and 15 map projections
- More than 60 alphabets, including upper and lower case Roman, Italic, Script, Greek, Russian, and Hebrew
- The ability to modify size and position of text to create subscripting and superscripting
- Built-in world coastlines, national boundaries, and U.S. state boundaries
- Selectable line types and curve markers
- Multiple curve interpolation
- Bar, line, and pie charts
- Shading of characters, bars, pie segments, and areas

GDDM/PGF (Graphical Data Display Manager and Presentation Graphics Feature)—a product of IBM, GDDM/PGF provides a means to generate graphic representation of data on 3270 system displays and printers with minimal effort. Features of GDDM/PGF include the following:

- Provides an Applications program interface between the application and the terminals
- Shields the programmer from complex data stream generation, buffering, and communications programming
- Allows the presentation of data in graphical form, which facilitates the interpretation of data

Neshaminy Valley Information Processing, Inc. (NVIP)

SAS/Graph—a powerful interactive color graphics product of SAS Institute Inc. SAS/Graph is a device-intelligent computer graphics system for use with CRTs and other graphics output devices. SAS/Graph can produce:

- Point plots
- Line graphs
- Bar charts
- Histograms
- Pie charts
- Three-dimensional displays
- Contour plots
- Maps
- Pictographs

SAS/Graph allows the user to specify titles and footnotes and to annotate the display.

Symap—a printer graphics system from Harvard University Laboratory for Computer Graphics that provides more than 35 options for tailoring graphics output. Symap features include the following:

- Map type variations such as size, scale, plotting symbols, and number of data levels
- Mathematical computations performed on data before mapping
- Scale of tones from black to white created by combining standard printer symbols
- Raw data rescaling
- Data zoning

Tell-A-Graf—a flexible interactive graphics system from Integrated Software Systems Corporation that allows a user to generate production-quality standard graphs, such as bar charts, pie charts, and line graphs through English-language commands. Standard graphs are easily customized through the system's extensive options. These options may be stored for repeated use. Tell-A-Graf features include the following:

- Linear or logarithmic axes
- Scattered, connected, or regression approximated data points
- Pie charts
- Clustered, stacked, or hidden bar charts
- Complex typographical characters or single-stroke characters
- Chain-dotted, dotted, dashed, and chain-dashed grid and curve textures
- Various shading patterns

Terminal Emulation

SIM 3278—a product of AZ-TEK Computing Inc., SIM 3278 is a VM/370 program that allows a variety of asynchronous TTY terminals to be supported as simulated IBM 3278 terminals, allowing for various full-screen facilities by TTY terminals.

Transportation

UTPS (Urban Transportation Planning System)—developed and maintained by the Urban Mass Transportation Administration and the Federal Highway Administration, UTPS is a collection of programs for use in planning multimodel transportation systems. The objective of UTPS is to provide readily available, easy-to-use, and fully tested planning tools to transportation planners for applications to a wide variety of problems.

NETWORKING SERVICES

NVIP clients can access the computers in Trevose, Pennsylvania through direct-dial telephone lines, leased telephone lines, Tymshare's Tymnet or GTE Telenet nationwide time-shared telecommunications networks, or the NV NET (SNA) shared dedicated service nationwide, Canada and Europe.

NVIP's telecommunications network hardware consists of the following:

- Four IBM 3705 communications controllers
- One Comten 3650 communications controller
- Two Comten 3690 communications controllers
- One Comten 3670 communications controller

NVIP's communications capacities include:

- Asynchronous dial-up 110 to 1200 baud
- Bsynchronous dial-up 2400 and 4800 baud
- Bsynchronous dedicated 2400 to 14,400 baud
- SDLC dial-up 2400 and 4800 baud
- SDLC dedicated
- Tymnet Asynchronous worldwide X.25

NVIP is continually updating its teleprocessing equipment in order to supply clients with state-of-the-art teleprocessing capabilities.

Currently NVIP utilizes the IBM 3705s for SNA (System Network Architecture)-type communications. This allows supported terminals to access those applications which have VTAM (Virtal Telecommunications Access Method) support.

NCP (Network Control Program) is a communications capability that allow access to TSO, Wylbur, Roscoe, a generalized CICS, and a specialized CICS through one terminal. This capability substantially decreases communications costs by reducing the number of terminals, lines, modems, and ports previously required for each function.

ON-LINE DATABASES

NVIP supports no public on-line databases, although its clients' individual databases are on-line and available for client processing.

Neshaminy Valley Information Processing, Inc. (NVIP)

▷ OTHER PROFESSIONAL SERVICES

NVIP provides custom programming support for clients who use the on-line and batch processing systems. NVIP's technical personnel provide specialized support in the following areas:

- Administration
- Applications
- Customer support
- Communications
- CICS
- Operating systems
- Operations
- Marketing
- System planning

NVIP also provides technical support to other Combined International Corporation subsidiaries.

NVIP's branch office RJE facilities are available for clients' use, providing card readers, line printers, terminals, and other equipment on-site.

FUTURE PLANS

NVIP plans to continue to expand and upgrade its hardware resources to maintain its customer service and turnaround time performance records. Near-term enhancements will include continued expansion systems and software. NVIP also plans to continue to expand its telecommunications network on an international basis. Additional facilities are being planned throughout the country.

NVIP's technical staff provides a continually upgraded operating system environment. New applications packages are always being evaluated and are offered on the NVIP system when appropriate. □

Network Computing Corporation

Network Computing Corporation (NCC) provides advanced information processing services for utilities, principally municipal, electric cooperative, gas, and water. Its on-line utility application areas include finance, financial forecasting and cost of service, consumer information, engineering databases and analysis, materials management, work order/job cost accounting, payroll and personnel, transportation, and word processing.

NCC reports that its proprietary software is used by clients throughout the U.S., from Anchorage to Miami, to process more than 2.5 million utility bills monthly. NCC provides on-line systems from its Charlotte, NC data center. This data center maintains on-line communications with over 600 terminals via 16,000 miles of dedicated high-speed data circuits.

NCC's software is designed for large-scale IBM and IBM-compatible mainframe computers. Network Computing offers its products via three delivery mechanisms—remote processing, program license, and a turnkey hardware/software solution.

COMPANY INFORMATION

Network Computing Corporation
5301-77 Center Drive
Charlotte, NC 28210
Telephone (704) 525-8810

Company Background

Founded in 1970, Network Computing Corporation (NCC) provides computer software and services to the utility industry. The company's staff has grown from 5 to more than 100, and NCC now claims to be the leading supplier of information services to utilities. Its staff provides programming, processing, and reporting services. Formerly a subsidiary of National Spinning Company Inc., Network Computing Corporation became a privately held company in 1984.

More than 85 utilities (mainly electric and water companies) in 16 states use a broad range of application packages covering all aspects of utility operation. These utilities use NCC's proprietary software to process more than 2.5 million utility bills each month.

Principal application packages offered by the company include:

- Consumer information
- Payroll and personnel
- Finance
- Materials management
- Work order/job cost accounting
- Transportation
- Engineering database and analysis
- Financial forecasting and cost of service
- Word processing

All software is available on-line to clients who use Network Computing Corporation facilities through the company's communications network. The application software can also be licensed for in-house use. All software operates on large-scale IBM and IBM-compatible mainframes featuring a standard IBM operating system.

NCC's consumer information and billing application software, which operates on large IBM mainframe computers, uses the latest database management techniques and 4th generation languages. NCC's personnel provide full system support for the company's software, both on Network Computing Corporation computers and on clients' in-house computers.

A staff of systems and programming professionals is available to provide consulting assistance to customers and to develop customized systems.

RESOURCES AND FACILITIES

Systems Software

OPERATING SYSTEMS: NCC runs IBM's MVS/SP operating system on its processor. The systems software includes:

- CICS/VS
- DMS/VS
- ACF/NCP network control program
- ACF/VTAM telecommunications access method
- UCC-I tape management system
- UCC-II restart recovery system
- RMF resource management facility
- OMEGAMON resource monitors
- MVS and CICS

DATA AND DATABASE MANAGEMENT: NCC provides extensive database management software to support its utility industry packages. Recent additions include the full complement of Cullinet's database management packages.

LANGUAGES: NCC supports the following programming languages on its computers:

- Assembler
- Cobol
- Fortran

▷

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- PL/1
- SAS

PROGRAM DEVELOPMENT AIDS: NCC supports several programmer productivity tools and program development aids. Some are described below.

Extracto is a report generator and file maintenance system that uses simple, English-like commands to request information. Complex and compound search conditions and complete mathematical capabilities are provided.

Extracto reports include:

- Simple lists
- Complex tabulated reports
- Preprinted forms
- Mailing labels
- Copies of updated and rewritten input data files

Librarian is a source program management system from Applied Data Research, Inc. used to store and retrieve source, JCL, data, and text from one or more central master files.

Librarian's comprehensive reporting facilities provide standard report formats, easy-to-specify customized reports, and update activity reports. Extensive auditing and security features are provided. Simple commands are used to:

- Add, change, and delete numbers
- Insert, delete, replace, edit, and scan records
- Process a group of modules by common criteria
- Verify source language syntax

Roscoe is a terminal access system from Applied Data Research, Inc. that allows easy file manipulation, conversational remote job entry, and file retrieval. Roscoe includes such facilities as:

- Cobol, Fortran, PL/1, and JCL syntax checkers
- Batch job output review
- High-level interactive language
- Interface to the Librarian source library manager

TSO is IBM's time-sharing option that supports interactive time-sharing. Programmers at remote terminals can develop, execute, store, and modify programs written in any MVS-supported language. TSO offers:

- Data set utilities
- Cobol, Fortran, and Assembler prompters
- Interactive Cobol debug facilities
- High-level interactive language

Customer Support Services

NCC's customer support includes a group of specialists who travel to client sites to discuss problems, changes, or new requirements for the company's services.

In addition to these specialists, a group of technical specialists in Network Computing's Charlotte headquarters answer questions and solve client problems over the telephone when a problem does not require on-site assistance.

Sales and Marketing Services

NCC provides sales and marketing services from its headquarters.

INDUSTRY-SPECIFIC SERVICES

Utilities

NCC provides sophisticated applications software for the utility industry. Every remote client operates in an interactive environment, accessing Network Computing Corporation's facilities through the company's nationwide network. NCC's utility industry packages are based on an on-line database management system providing:

- Data collection and validation
- Database update
- Inquiry
- Flexible reporting capabilities
- Flexible output handling

NCC's integrated utility information processing system consists of these on-line subsystems:

- Consumer information and billing
- Personnel and payroll
- Finance
- Materials management
- Work order/job cost accounting
- Transportation accounting
- Engineering database and analysis

Consumer Information—provides facilities necessary to maintain services and consumer information for a broad range of activities. Functions include:

- Regular billing
- Final billing
- Accounts receivable posted throughout the day
- Budget payment plan billing
- Deposit accounting with automatic interest computation
- Service order processing
- Credit history processing with 13 periods of billing history on-line
- Bad-debt processing with automatic aging and write-off
- Bank draft preparation
- Penalty/late fee computation and billing
- Consumer loan processing for up to nine loans per account
- Inquiry processing
- On-line billing and accounts receivable history
- Meter tracking/inventory

Special Consumer Information features for electric utilities include:

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- Membership records and accounting for electric co-ops
- Patronage and capital credit processing for electric co-ops
- Distribution system inventory records
- Engineering analysis

Customer Order Processing (COPS)—a subsystem of the Consumer Information System that provides for automated processing of service orders (connects, transfers, new services, etc.). Through COPS, a utility can customize its video screen formats to collect order data. COPS offers the following features:

- Service order work in progress file
- Customized input and output screens
- Reporting

Personnel and Payroll—provides a complete system to process on-line employee data, labor distribution information, and associated equipment costs. Information is entered and maintained on-line with immediate validation capabilities. Employee information can be accessed through employee number or employee name. Reports, generated monthly and at the end of each pay period, include:

- Labor hours and costs by department
- Labor hours and costs by job
- Equipment usage and standard cost by job
- Quarterly and yearly federal, state, and local tax reports

On-line personnel employee database information includes:

- Employee personal data, such as name and address
- Employment and salary history
- Accrued vacation, sick, and holiday time
- Regular and overtime hours and wages
- FICA, federal, state, and other taxes
- Voluntary deductions
- Direct deposits via Automated Clearing House (ACH)

Finance—used to control and report financial activities for a utility. The integrated Finance Subsystem includes:

- On-line vendor accounting and reporting
- On-line accounts payable
- On-line chart of accounts, balances, and transactions
- Off-line statement of operations, balance sheets, general ledger, and financial reports

After the books are closed for a month, all transactions and general ledger accounts are reported in a trial balance; any further transactions are placed in the next month's accounting. The account numbers can be customized to meet each client's organizational needs; validity checks and double entry accounting features are standard.

Accounts payable are automatically aged with checks produced on the entered due dates. Financial reports are generated at the client's request. The Finance Subsystem contains automatic interfaces to these other utility support subsystems:

- Consumer information
- Payroll
- Materials management
- Job costing
- Transportation

Materials management—designed to control inventory levels and to balance with the general ledger inventory totals. Integrated with the job cost subsystem, Materials Management features include:

- Multiple warehouse locations
- Maximum/minimum levels
- EOQ
- Average cost
- YTD transactions
- Invoiced and noninvoiced amounts
- Special equipment

The Materials Management System processes these on-line transactions affecting inventory values and quantities:

- Purchase order quantities
- Receipts
- Invoice costs
- Issues
- Returns
- Retirements
- Adjustments
- Inquiries

Work Order/Job Cost Accounting—captures and displays complete specifications for a job. Month-end reports show job cost accounting. The entire database is on-line and available for inquiry at all times.

Work Order/Job Cost Accounting features include:

- Complete description of job, customer, warehouse, crew, location, beginning date, and ending date
- Standard and actuals on labor hours, labor costs, and material costs
- Standard and actuals on overhead and contribution
- Complete description of each assembly item required by line and pole
- MTD and job-to-date totals of all issues, labor hours, costs, and retirements

Transportation Accounting—used to maintain a history on each vehicle and equipment item used by a utility. On-line access is possible for the prior 13 months of activity and costs for cars, trucks, trailers, ditch diggers, bulldozers, cranes, and other vehicles. Reports analyze costs by unit, cost center, work order, or other criteria.

The Transportation Accounting Subsystem is integrated with other Network Computing Corporation utility support subsystems as follows:

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Network Computing Corporation

▷
- Payroll: Vehicle and equipment usage data are extracted from time sheets and entered along with the payroll data.
- Materials management: Oil, gas, tires, parts, and other issues are recorded by vehicle or equipment number and are available to the transportation system.
- Accounts payable: Invoices are recorded with vehicle or equipment number, and expense data are made available to the Transportation System.
- General ledger: All transportation overhead, expenses, depreciation, taxes, etc. are available to the Transportation System for month-end closing.

Engineering Database and Analysis—designed to maintain an up-to-date model of an electric power distribution system.

Database information includes:

- Meters
- Services (metering points)
- Transformers
- Transformer stations
- Line sections by phase
- Node points
- Electrical apparatus such as reclosers, capacitors, regulators, fuses, and relays

This information is used for numerous analysis programs, including:

- Transformer loading
- Line section/phase loading
- Fault current and short circuit analysis
- Voltage drop analysis
- Capacitor placement
- Regulator placement

NETWORKING SERVICES

Network Computing Corporation maintains a nationwide network consisting of more than 20,000 miles of communications lines. IBM 3705-II communication control units interface with CRT terminals across the United States. Testing is complete for satellite communications to begin this year.

ON-LINE DATABASES

Network Computing Corporation supports no public on-line databases, although its clients' individual databases are on-line and available for client processing.

OTHER SERVICES

Consulting

Network Computing Corporation provides management consulting services in these areas:

- Organization and staffing
- Administrative and accounting procedures
- Cost of service analysis
- Credit and collection procedures

The engineering consulting group provides electric distribution consulting services including:

- Rate analysis
- Rate design
- Long-range work planning
- Distribution system engineering analysis

Microfilm services for historical printed records are available. In addition, Network Computing Corporation can produce microfiche, as well as paper copies for any computer printouts.

Facilities Management

Network Computing Corporation provides full facilities management services for either on-site or remote client computers.

FUTURE PLANS

Network Computing Corporation's ongoing development of new products will continue, with more than 15 full-time professionals dedicated to new product development. Enhancements to existing products and the introduction of new products will proceed at a steady pace. □

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Progressive Management Services, Inc. (PMS)

Progressive Management Services, Inc. (PMS), a privately owned company established in 1972, provides on-line batch and timesharing services through a service bureau environment. PMS' applications offerings include accounting services, a payroll system, inventory control systems, medical systems, word processing, and an insurance agency management system. PMS also provides a full offering of computer hardware and services that includes mini-/microcomputers, terminals, printers, equipment maintenance, facilities management, and computer education.

COMPANY INFORMATION

Progressive Management Services, Inc. (PMS)
2828 Anthony Lane South
Minneapolis, MN 55418
Telephone (612) 781-6521

Company Background

Progressive Management Services (PMS), headquartered in Minneapolis, MN, serves the business community with solutions to data processing needs. PMS offers applications covering accounting services, inventory control, medical systems, insurance, and word processing. The company also provides a complete range of computer services that include computer system studies, computer programming, on-line batch computer services, timesharing services, business consulting services, customer education, and operator training.

In addition to the complete computer services offered, PMS also has a full offering of computer hardware, along with expanded services to support this hardware. PMS' computer hardware offering includes mini-/microcomputers, computer terminals, computer printer terminals, equipment maintenance, facilities management, and computer education.

PMS has extensive experience in industries such as distribution (wholesale and retail), manufacturing, professional services, and education institutions.

Competitive Position

Progressive Management Services, Inc. (PMS) is geared toward small- to medium-size business markets. The company has a staff of 13 employees that provides data processing and customer support. PMS' competitors are computer stores, but its main on-line competitor is Automatic Data Processing, Inc. (ADP). According to a company spoksperson, PMS ranks third in the data processing market. PMS does not report its revenues since it is a private company, however, the company's revenues have increased from the previous year.

RESOURCES AND FACILITIES

Processing Centers

PMS' two processing centers are located in Minneapolis, MN and San Diego, CA, housing the company's computers for on-line batch and time-sharing services. The Minneapolis facility contains:

- Two Digital Equipment Corporation (DEC) PDP 11/70s (768K bytes/CPU)
- CDC disk drives (900 megabytes of on-line disk storage)
- Kennedy tape drives
- Emulex controllers
- Printronix dot matrix printers

The San Diego facility contains:

- One Digital Equipment Corporation PDP 11/34 (128K bytes)
- CDC disk drives (600 megabytes of on-line disk storage)
- Kennedy tape drives
- Emulex controller
- Printronix dot matrix printers

Systems Software

OPERATING SYSTEM: PMS' DEC computer systems run under the RSTS/E operating system.

LANGUAGES: PMS provides the following languages:

- Basic
- Basic +
- Basic +2
- RPG II
- Fortran

DATABASE MANAGEMENT: PMS provides its clients with the *ONLINE/480* database management system, that is designed for RSTS/E and CTS 500 operating environments. ONLINE/480 achieves efficiency through functional modules that are combined and modified to suit all types of application purposes. Fully dictionary-driven, ONLINE/480 systems can be modified as the applications change, making maintenance easy. ONLINE/480 incorporates a file access technique that allows any disk record to be retrieved within two disk accesses.

Customer Support Services

PMS maintains a staff of 13 data processing professionals devoted to the function of providing customer support to its clients. These professionals aid in system studies and ▶

Progressive Management Services, Inc. (PMS)

design, business consulting, customer education, and operator training. Consulting services and training can be performed at the PMS facility or at the client's site.

Sales and Marketing Strategy

PMS' marketing strategy is to automate a customer's system, either with batch or on-line processing. For customers that currently use a batch system, the strategy is to bring a customer onto an on-line or in-house microcomputer system.

APPLICATION-SPECIFIC SERVICES

Accounting Services

The *Retail Inventory Management System (RIM)* provides sales reports, purchase and receiving reports by vendor, interstore transfer reports, and retail inventory management reports. These reports are by classification, department and store, and are output on a weekly or monthly basis. Sales input by classification, including register and the sales audit report, are on a daily basis. This system also provides a sales analysis capability.

The *Accounts Payable* program provides the following features:

- Vendor file maintenance, vendor lists, and vendor purchase history
- Invoice input by line account
- Batch edit reports and batch total reports
- A cash requirements list summarized by date with accumulated total
- A cash requirements list detailed by invoice by day
- Open invoices by vendor
- Accounts payable checks
- Check register by batch and monthly
- Distribution register by batch and monthly
- 1099s

The *Accounts Receivable and Sales Reporting* program includes the following features:

- Input of sales and payments
- Audits of batches
- Customer file maintenance
- Customer list
- Monthly statements
- Monthly aging
- Transaction register (condensed statement)
- Availability of sales analysis
- Microfiche output of statements (optional)

PMS's *General Ledger* system offers the following:

- Chart of accounts
- Journal entry
- Journal audit
- Journal
- Ledger
- Balance sheet
- Profit and loss statement
- Manager's reports, including income statement location (current month and YTD versus budget month and YTD)

The general ledger system also allows inquiries on selected accounts.

Payroll

Some of the features provided by PMS' payroll system are as follows:

- Deduction audit for hourly and salary employees
- Hours of earnings for hourly and salary employees
- Employee list
- Check register and check printing
- Payroll file edit
- Pension plan report
- Salary structure report
- Tax report; quarterly 941s; and W2s
- Workman's compensation

Inventory Control

The *PMS Manufacturing Inventory Control System* consists of fully integrated, menu-driven modules. This system is designed to manage finished goods inventory, to keep track of component parts inventory, to control and schedule production, to establish standard costs of production, and to measure actual costs against standard costs.

Reports generated by this system include the following:

- Finished goods inventory valuation report (shows units and dollars on hand, on order, and back ordered, for each item and in total)
- Reports for parts inventory
- Sales and gross margin dollars for each item and in total (a month-end report)
- Bills of material for finished goods items, listing all parts and subassemblies used
- "Where used list" of all parts and subassemblies
- Production work order, showing what and how many items must be produced
- Materials planning and requirements report, which analyzes parts and subassembly quantities based on current production to determine if inventory is sufficient

The *PMS Wholesale/Retail Inventory Management System* provides the wholesale or retail distributor with comprehensive, computerized control—from the point of ordering merchandise, through invoicing all the way to collection of receivables. This system is available to run either on PMS timesharing computers or on microcomputers available from PMS. Some of the features offered by the system are listed as follows:

- Direct interface to cash registers

- Purchase and receiving reports by vendor, classification, and store
- Interstore transfer
- Inventory valuation report
- Sales and gross margin dollars
- Monthly sales register
- Open accounts receivable system
- Commission reporting
- Maintenance functions with error checking and data validation

PMS inventory control systems are compatible with the company's general ledger, accounts receivable, accounts payable, and payroll systems.

Medical Systems

The *Clinical Management Information System (CMIS)* provides procedures for processing day-to-day functions, as well as reporting and inquiry procedures that allow for immediate diagnosis and correction of possible problem areas. Features of CMIS include:

- Patient registration and maintenance of demographic data
- Automatic assignment of new patient numbers
- "Superbill" and balance forward statements to enable original and follow-up billing
- Automatic pricing of charges
- Accounts receivable status inquiry by name or account number
- Integrated collection system
- Generation of private insurance, Medicare, and Workmen's Compensation forms
- Insurance delinquency reporting
- Summary and detail reports, by doctor, with clinic totals
- Integrated word processing
- Integrated to other on-line accounting systems

Insurance

The *Agency Management System* provides an on-line customer, policy, and prospect file. Data entry and file maintenance, instantaneous inquiry, and printing of customer directories or prospect lists can all be accomplished via the client terminal. The system also provides for:

- Daily accounts receivable processing (invoicing, credit memos, payment posting, and bank deposit statements)
- Monthly accounts receivable processing (accounts receivable journal, aging, customer statements, direct bill renewal list, producers and brokers statements, and YTD recaps)
- Preparation of ACORD forms
- Word processing
- Installation support
- On-line 480 (a tool to further enable client interaction with their computer data files)

Word Processing

PMS provides an office automation system, including a word processing system that is fully compatible with other PMS systems.

NETWORKING SERVICES

PMS' on-line timesharing services are performed over dial-up telephone lines.

ON-LINE DATABASES

Seminary Library Systems—contains bibliographic information for four seminary libraries (Lutheran, Catholic, Baptist, Ecumenical) and the Midwest China Center. Approximately 200,000 records in MARC format are presently in the database, with about 6,000 titles added each year. The main use of this database is for cataloging of theological works of which the majority of the holdings are books or cassette tape collections; no periodicals have been entered.

OTHER PROFESSIONAL SERVICES

PMS offers business consulting services, computer education, and operator training at the PMS facility or at the clients' facilities. In addition, PMS offers a full range of computer hardware and services, including mini-/microcomputers, computer terminals, computer printer terminals, equipment maintenance, and facilities management.

PMS also supports a network of distributorships that sell and service computers. □

Securities Data Company, Inc.

Securities Data Company, Inc. provides on-line access to securities information databases. The available databases contain data on mergers and acquisitions, new issues of publicly offered corporate securities, municipal debt, and private placements.

Securities Data Company, Inc. maintains its databases on Prime computers located in New York. Clients gain access to the computer center via either direct dial-up or through the Telenet worldwide telecommunications network.

Securities Data Company, Inc. also provides custom programming for their clients and produces weekly surveys of new issues of corporate securities and municipal debt.

COMPANY INFORMATION

Securities Data Company, Inc.
62 William Street
New York, NY 10005
Telephone (212) 668-0940

Company Background

Securities Data Company, Inc. provides on-line information on new issues of publicly offered corporate securities to the investment banking community. Since 1975, Securities Data Company has expanded its reach to include databases on municipal debt, private placements, and mergers and acquisitions. Today, Securities Data Company's 30 employees devote full-time in providing up-to-the-minute information and quality service to all of Securities Data Company's clients.

Securities Data Company makes its data available to its clients on-line through its four Prime computers located in New York. Securities Data Company's proprietary databases and user-friendly database interface software have attracted clients in such businesses as:

- Investment banks
- Financial brokerage firms
- Banks
- Financial institutions
- Advertising firms
- Financial publications

Clients may gain access to the Securities Data Company computer system by direct dialing to the computer center or via the Telenet worldwide data communications network.

Securities Data Company also offers general time-sharing services on its Prime computers, and provides emergency backup facilities for firms that use Prime computers.

RESOURCES AND FACILITIES

Processing Centers

The Securities Data Company computer center, located in New York, houses Prime computers which control access to the Securities Data Company proprietary databases through its own software systems. Securities Data's equipment includes the following:

- 3 Prime 750s
- 1 Prime 9950

Systems Software

OPERATING SYSTEMS: Securities Data Company uses the Primos operating system supplied by Prime Computer, Inc. This is a multi-user, virtual memory disk operating system which includes all the facilities necessary to handle resource allocation for multiple on-line users.

DATA AND DATABASE MANAGEMENT: The Securities Data Company securities databases are maintained by the Securities Data Company staff. Clients are not generally involved in the details of database management and experience only the user interface to the various databases.

The user interface to the databases is a menu-oriented system in which the user chooses from lists of databases, selection criteria, and report formats. Once all required choices are made, the query is completed and the requested reports are generated.

LANGUAGES: Securities Data Company clients are not generally involved in programming. Securities Data Company does provide custom programming on request.

Customer Support Services

Securities Data Company maintains a staff at their New York offices who will answer questions from clients concerning use of the Securities Data Company database inquiry system.

Securities Data Company also supplies manuals documenting use of its system and will provide training to clients who require it.

Sales and Marketing Services

Securities Data Company marketing efforts are carried out exclusively from its New York offices. Securities Data Company's primary clients are brokerage houses, corporations, investment banks, commercial banks, advertising firms, and financial publications.

▷

▷ NETWORKING SERVICES

Clients may access Securities Data Company's Prime computers either through direct dial-up or via the Telenet worldwide telecommunications network. Any terminal type supported by the Telenet network is suitable for access to the Securities Data Company databases.

ON-LINE DATABASES

Banking and Finance

Mergers and Acquisitions—tracks mergers, tender offers, and exchange offers which occur in the U.S. and abroad. This database, thus far, contains data from 1981 to the present and is continually updated. The information in the database covers such areas as:

- Target company's financial position
- Acquiring company's financial position
- Managers and fees
- Specifics of each transaction
- Price tracking
- Geographical location of both target and acquirer

This database is used by such clients as investment banks, law firms, and corporations to assist in producing reports, in market research, and in the structuring of new mergers.

New Issues of Corporate Securities—provides data on publicly offered new issues of taxable debt, common stock, and preferred stock in the U.S. The data covers the period from 1970 to the present and is continually updated. Approximately 80 data items are maintained for each issue, including the following:

- Description and terms of the issue
- Underwriters and fees
- Capitalization of issuer
- Data from financial statements
- Information from prospectus
- Geographical location of issuer
- For common stock
  - —number of shares
  - —price history
- For preferred stock
  - —dividend
  - —redemption and sinking fund provisions
- For debt issues
  - —coupon
  - —maturity
  - —trustee
  - —call and sinking fund provisions
  - —fixed charge coverage

This database is used by such clients as investment banks, brokerage firms, and other financial institutions to assist in producing reports, in market and historical research, and in making pricing decisions.

New Issues of Municipal Debt—provides data on new issues of publicly offered and privately placed tax-exempt negotiated debt. The information in the database covers the period from 1980 to the present and is continually updated. The information, for all proceed types, includes:

- Coupon
- Offering price
- Maturity
- Call and sinking fund provisions
- Underwriters and fees
- Trustee
- Geographical location of issuer

This database is used by such clients as investment banks, commercial banks, and government agencies to assist in producing reports, in market and historical research, and in making pricing decisions.

Private Placements—provides information on private placements of corporate securities since 1981. The database includes such information as:

- Total amount placed
- Coupon rate
- Maturity
- Agents
- Purchasers
- Geographical location of issuer
- Number of shares
- Offering price

This database is used by such clients as banks, brokerage firms, and other financial institutions to assist in producing reports and in market and historical research.

OTHER PROFESSIONAL SERVICES

In addition to their on-line securities databases, Securities Data Company offers custom programming on request to assist clients with special information needs.

Securities Data Company also publishes surveys from the information contained in its New Issues databases.

FUTURE PLANS

Securities Data Company will continue to improve its coverage of the securities industry, anticipating and responding to changing market conditions in order to provide the highest quality service to its clients. □

UCCEL Corporation

▷ ties is maintained by Telecommunications in Fasbac II Library files on all systems.

The UCCEL London Link is a trans-Atlantic cable that sends information between the Cyber Service Center in Dallas and UCCEL's Univac Service Center in London. It allows users operating remote terminals located in the United Kingdom or Europe to communicate with the Cyber Center after accessing the London Univac Center.

Users of UCCEL's London Univac Center can call on Cyber hardware and software whenever necessary. In addition, due to the time difference between London and Dallas, the user can access the Cyber Center during the evening and early morning hours. During these hours, the center has fewer jobs to process, so turnaround time is minimized.

No matter how users communicate with the Cyber Service Center, UCCEL Telecommunications works to prevent and correct transmission problems. The telecommunications group, located at UCCEL's computer center in Dallas, includes highly qualified communications engineers who use the latest monitoring and test equipment to ensure proper operation of the UCCEL communications network.

ON-LINE DATABASES

Detailed information on this database may be found in the On-line Databases section (OL40) of this publication.

Iris—a database containing infrared spectral characteristics for a wide range of chemical substances.

OTHER PROFESSIONAL SERVICES

UCCEL offers on-site training and training workshops in support of its software and services. Training schedules range from monthly to quarterly, and promote contact among users of UCCEL software and services.

UCCEL supports annual conferences to users of their products and services. These conferences serve as a forum for the exchange of ideas and experiences in connection with UCCEL offerings. Information derived from these meetings influences the future development of UCCEL products.

In addition to remote computing services, UCCEL's Software Division produces applications software for commercial, and financial applications, and operating software for IBM Data Centers.

The UCCEL Digital Systems Division specializes in minicomputer software and turnkey systems for accounting professionals in the U.S. Open Systems, Inc., UCCEL's microsoftware company, specializes in microcomputer-based accounting software, ideally suited for small businesses.

FUTURE PLANS

UCCEL's future plans include "LEAP" (Leading Edge Applications Project), which is a development program that will be offering integrated applications for the IBM mainframe. □

Xerox Computer Services

COMPANY INFORMATION

Xerox Computer Services
5310 Beethoven Street
Los Angeles, CA 90066
Telephone (213) 306-4000

A division of the Xerox Corporation, Xerox Computer Services was founded in 1970. The company provides on-line computer services, hardware, and software to more than 900 manufacturing and distribution organizations, serving customers in the United States, and, to an increasing degree, Europe.

Xerox software is provided either as on-line services or as licensed software and consists of the Xerox Manufacturing System, which runs on IBM computers. Xerox Computer Services also offers a complete turnkey system for manufacturers that bundles its manufacturing software with an IBM 4300 or IBM 9370 Series computer.

Company Background

Xerox Computer Services, a division of the Xerox Corporation, was founded in 1970. It provides on-line computer services, software packages for IBM and IBM-compatible computers, computer hardware, turnkey systems, distributed data processing capabilities, and network services. The company has customers throughout the United States and Europe.

Xerox Computer Services specializes in providing computer services to the manufacturing industry (among others), and has the second largest number of functional Material Requirements Planning (MRP) installations in the United States. Its distribution industry customers range from the small (single site) organization to major international companies with locations in more than 22 states. Xerox Computer Services also offers a software product line, the Xerox Business Management System, which is geared to its large market in the manufacturing and distribution industries.

Although in recent years Xerox Computer Services has seen its time-sharing business decrease, revenues brought in by new ventures have more than made up for any revenue losses. These new ventures include a turnkey system and licensed software products. Also, in 1986, Xerox Computer Services introduced a satellite network, called Skyway. Skyway is designed to integrate a company's remote-site data processing needs with its host computer operations.

The company's software products are designed for IBM and IBM-compatible computers. These products are available either through the Xerox on-line computer services, through a license agreement in which the Xerox software is run on the customer's own IBM or IBM-compatible computer, or as a turnkey system that combines Xerox software with IBM hardware.

Applications can be run in an interactive, on-line environment, assuring that data is immediately updated whenever a transaction occurs and that all information reflects the current status of the user's organization. The following applications are available:

- Physical inventory
- Order management
- Inventory management
- Receivables management
- Sales management
- Accounts payable
- General ledger
- Material requirements planning
- Cost planning and control
- Production control
- Master production scheduling
- Repetitive manufacturing
- Random stores
- Fixed assets
- Payroll/labor distribution
- Procurement management
- Employee information

In addition to offering specialized software to the manufacturing and distribution industries, Xerox Computer Services offers:

- A pricing policy wherein customers are charged for fixed blocks of resources actually used, and which is responsive to customers' business volumes
- A satellite data communications network
- Rapid system development and implementation
- A library of prepackaged software systems for solving common business problems
- Immediate information access
- An international communications network
- Processing capabilities of high-speed, large-scale computer mainframes
- An automatic interface with its applications programs

The information management system packages currently available include the following:

- Financial Management package for budgeting, forecasting, planning, financial modeling, analysis, consolidation, and graphics display

- Database Management package for creating, maintaining, and updating a database, and for producing reports from the data

▻

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Xerox Computer Services

- Word Processing package for list maintenance, personalized mailing, document preparation, and document updating

- Statistical Analysis packages for a number of applications, including market research and engineering

Based on a database of information required by manufacturing and distribution businesses, Xerox' modular software is driven by interactive menus. A user can easily create specialized transactions; update, verify, or extract data; or generate reports.

Xerox manufacturing systems include:

- Inventory control
- Random stores
- Purchase orders
- Engineering data control
- Factory order control and cost
- Material requirements planning
- Capacity planning and scheduling
- Repetitive manufacturing

Distribution systems include:

- Order entry and invoicing
- Sales analysis
- Inventory control
- Purchase order

RESOURCES AND FACILITIES

Processing Centers

Xerox Computer Services' nationwide data center is located in Los Angeles and provides service to its customers through a network of telecommunications hardware and associated software. Customers input data using terminals located in their offices. Data is transmitted to production centers distributed throughout the continental United States and Europe. Production center computers function as line concentrators and message routing systems, in addition to handling printing. Reports are printed at either the customer's terminal or on a production center printer.

The Xerox Computer Services National Data Center contains the following equipment:

- Five mainframe computers, including IBM 3083B, IBM 3033, and Amdahl 470/V8 models
- 34 STC 3670 tape drives
- 206 disk drives: 128 STC 8350s, 52 IBM 3350s, 14 STC 8650s, and 12 IBM 3380s
- Three Documentation 1200 printers

To better serve its expanding base of European customers, Xerox Computer Services operates a data center in Venray, Holland. By transmitting data to and from Venray, rather than the United States, problems associated with different time zones, hours of service, and availability of underwater longlines have been eliminated.

Systems Software

The Xerox Computer Services National Data Center has at its disposal the standard operating systems, teleprocessing monitors, utilities, database management systems, and programming languages offered by the manufacturers of its mainframe computers.

In addition to applications software, the following Xerox Computer Services utilities are available:

- Reporter III, including full-screen facility
- Definer III
- Filer III

Customer Support Services

Customer support is provided in systems service, systems engineering, and customer service by a staff of full-time Xerox professionals.

Xerox provides an 800 line to connect the customer with its *Quality Customer Service (QCS)* facility that, according to the company, is staffed with highly trained technical specialists. QCS provides an automatic call distribution system to manage inbound calls, and each problem is logged by an incident dispatch/tracking system. Most questions can be answered immediately by the Xerox specialist. Certain hardware, line, or software problems are dispatched to technical consultants in Los Angeles or at the Xerox production center nearest the customer. Most terminal or line problems can be corrected through remote diagnostic procedures. Xerox reports that with the institution of the QCS system, 70 percent of its customer service inquiries are resolved within three minutes. QCS is staffed from 5:00 a.m. to 6:30 p.m. PST Monday through Friday and 6 a.m. to 3 p.m. PST Saturday.

A National Accounts Group, located at the Xerox Computer Services headquarters office, provides additional marketing and technical support for major multilocational customers. In this role, the Group acts as a coordination and direct communications interface between client corporation executives and Xerox Computer Services.

The staff at regional branch offices also provides printing facilities for customers' output reports, which are later sent to the customers via courier service. The regional branch offices also provide data collection and transmission services between customers and the data centers.

Training classes are considered part of each system installation so that customer staff can fully operate its specific system, from terminal operation and data entry through management report generation. Ongoing courses are held at the Xerox Computer Services headquarters in California and at some Xerox Computer Services branches.

Xerox Computer Services

▷ Xerox Computer Services publishes reference manuals for each customer application and system support tool and periodically sends updates for each manual to its customers. These reference manuals contain an overview of the system, descriptions of all terminal operations, and information and instructions for processing customer data.

Application systems documentation consists of the following:

- Product/application user reference manuals, containing detailed discussions of the application and associated terminal operation procedures
- Installation procedure manuals, containing procedures, checklists, checkpoints, and other information needed by the Xerox Computer Services staff when installing user applications
- Specifications manuals for each application, containing such information as report specifications and layouts, summary file descriptions and layouts, detail file descriptions and layouts, files affected by each transaction code, program overviews, and detailed specifications
- On-line publications that describe new services, enhancements to current services, and new products
- Technical release memoranda that describe the technical aspects of the on-line announcement, and which are geared to the Xerox Computer Services staff in particular

Sales and Marketing Services

Each regional Xerox Computer Services branch is an independent operating unit with sales, administrative, and technical personnel. Along with other marketing offices throughout the United States, these regional branches provide sales and marketing support as well as customer education and service support.

INDUSTRY-SPECIFIC SERVICES

With major markets in the manufacturing and distribution industries, Xerox Computer Services provides numerous packages geared to those industries.

Manufacturing

Xerox, a leading provider of software for the manufacturing industry, offers the Xerox Manufacturing Systems, which provide services from top-level planning to production. A comprehensive costing system, supplying actual costing and standard costing, a material requirements planning system, and a production control system, is also provided.

The company's "just-in-time" manufacturing system is designed to provide automated scheduling and information management support. Modeled after Japan's stockless production philosophy, the goal of the just-in-time system is to make sure that a company has at its plants the exact amount of material that is needed (and no more than is needed), *when it is needed.* This repetitive manufacturing application provides "just-in-time" planning and control capabilities for companies where production is driven by daily or weekly production rates, rather than fixed lot schedules.

Distribution

Packages are provided to support the full range of distribution organizations, from the smaller, single-location organizations to major international companies. Xerox Computer Services' distribution packages contain credit and inventory control software.

INFORMATION CENTER SERVICES

The Xerox *Second Generation Information Center* provides a unified systems architecture in that the Information Center software and the database are built together and consist of the following five systems:

- *Reporter II*—an advanced interactive report/query program generator used to generate standard report programs and queries
- *Filer II*—a user-oriented language that allows users to enter statements about how the computer should do the work
- *Definer II*—defines the contents and formats of files, records within files, and fields within records

Xerox Computer Services has increased its offerings for the Information Center with a new family of high-level user languages to simplify query, reporting, and manipulation of business data, and offers the following products:

- *Knowledge Worker*—a micro-based, menu-driven application that allows analysts to automatically extract and download data to a personal computer and then convert it for use with microcomputer applications
- *Accounting Manager*—a software program that provides a simple and flexible way to organize and report financial data

The Xerox Information Center systems are completely integrated with Xerox business applications to allow use of one common database. The systems are available independently or together as a complete information center. They can be purchased to run on the users' in-house system or to use the Xerox time-sharing network.

The Information Center's products are offered for use on the IBM 4300, 3000, 370, and 9370 Series computers using any of IBM's standard operating systems—SSX, VSE, VS/1, MVS, and VM—with either BTAM or VTAM access methods. ▷

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Xerox Computer Services

▷ The Information Center can be built around personal computers for personal computing needs, and as an intelligent terminal addressing a mainframe computer. Data can be extracted from business files in the host computer and downloaded to the personal computer for processing by a variety of personal computer software packages.

NETWORKING SERVICES

Xerox Computer Services operates one of the largest single-vendor communications networks in use today, consisting of over 240,000 miles of telephone lines: 160,000 miles interstate and 80,000 miles intrastate, serving more than 150 metropolitan areas and Europe.

Customers are using more than 4,000 terminals and microsystems to access the communications network through FDM and MVX equipment. Xerox branch Data Centers use message concentrators and front-end communications processors to communicate with the host computers at the Xerox Data Centers.

While most of its customers use either the Xerox 1340A error-checking terminals, or Xerox 820-II Information Processors, Xerox Computer Services also supports Xerox 1330 CRT terminals.

In early 1986, Xerox Computer Services introduced Skyway, a point-to-point network consisting of small earth stations, a satellite receiver/transmitter system, and a central earth station. Skyway is designed to integrate a company's remote site data processing needs with its host computer operations and provide two-way data transmissions via satellite.

ON-LINE DATABASES

Xerox Computer Services supports no public on-line databases, although its customers' individual databases are on-line and available for processing.

OTHER SERVICES

While Xerox Computer Services' major product is software, provided as either time-sharing services or as licensed software, the company also:

- Markets hardware/software turnkey systems
- Provides customer programming services
- Markets terminals for the computer network system
- Provides consulting services
- Provides educational services

As an IBM Value Remarketer, Value Added Distributor, and Applications Agent, Xerox Computer Services offers the Xerox Turnkey Manufacturing System, combining Xerox manufacturing software and IBM 4361 computers. Another turnkey system for the public service industry includes the same hardware but uses business applications specifically suited for public service agencies.

FUTURE PLANS

While Xerox Computer Services began by offering to do all of a customer's data processing on a time-shared basis, it is now offering turnkey systems and licensed applications software to operate on IBM and IBM-compatible mainframes, and Digital Equipment Corporation minicomputers.

Xerox Computer Services is also increasing its distributed computing capabilities, offering customers the choice of doing some data processing on-site through intelligent terminals with high-speed printers, and transmitting large jobs to Xerox production centers. In addition to Xerox 820-II Information Processors, the company will offer IBM PC/AT/XT model Personal Computers to customers for use with the Xerox time-sharing services.

In the manufacturing area, the company is staying ahead of new production trends like "just-in-time" manufacturing and computer-integrated manufacturing by developing new products for the Xerox Manufacturing System. Xerox Computer Services will continue to unveil several new capabilities in the future that underline its commitment to end-user support.

Xerox Computer Services is also committed to bringing the fastest, most cost-efficient methods of data transmission to market. For example, the company recently announced a satellite data communications network. When it becomes available later in 1987, the system will be supported by the IBM 9370 System. □

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Company Profiles—A-C

A/Tek Command
6404 Castleway Court
Indianapolis, IN 46250
(317) 842-3113

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor, selling software for use with DEC PDP-11/70/44/23
- —facilities manager
- —maintenance company

Applications emphasis: accounting; education; government; medical and health care; payroll and personnel; sales and distribution

President: Richard W. Herron
Date founded: 1967
No. of employees: 31; 25% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 20% from on-line svcs.
Primary customers: CPA firms, dairy companies, credit and collection bureaus, utility companies, associations
Sales concentration: home office

Product line: offers timesharing and batch processing services through their data center at the Indianapolis location. Additional applications include time and billing and dairy. Offers lease/rental services for timesharing clients wishing to rent terminals, printers, etc. Also provides customized software.

Access Innovations, Inc.
P.O. Box 40130
Albuquerque, NM 87196
(505) 265-3591

Principal business:
- —database producer

Applications emphasis: data management and database management; engineering and scientific; government

President: Marjorie M. K. Hlava
Date founded: 1978
No. of employees: 125
Rev. last FY: $1.0M-$4.9M
Primary customers: technical library and information centers; publishers; database producers
Sales concentration: worldwide

Product line: a full-service information management company offering a variety of technical and professional services for database design and production; data entry and conversion; abstracting and indexing; technical writing and editing; and contract personnel.

Future plans: to expand service line.

Accountants Computer Network, Inc.
5650 South Brainard, Suite 102
La Grange, IL 60525
(312) 354-8988

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor

Applications emphasis: accounting; banking and finance; payroll and personnel; transportation

President: Kenneth Kendrick
Date founded: 1977
No. of employees: 5; 100% devoted to on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides batch processing, conversion of programs, and on-line services for Prime and Honeywell computers. In addition, the company offers several vertical packages available for the florist and transportation industries.
Computer System.

Adams Engineering, Inc.
4801 Woodway; Suite 260E
Houston, TX 77050
(713) 961-1918

Principal business:
- —on-line computer services company
- —software vendor selling software to be run on DEC, Gould SEL, and Honeywell systems
- —consulting

Applications emphasis: engineering and scientific; petroleum

President: Neal J. Adams
Director of marketing: Betty K. Quay
Date founded: 1981
No. of employees: 4
Primary customers: petroleum operators; drilling contractors; service companies
Sales concentration: Houston, TX, servicing domestic U.S.

Product line: develops software, supports a time-sharing system, offers training, maintains an on-line database, and provides consulting for a number of petroleum companies and government agencies. A full line of drilling software is offered which includes programs addressing drilling engineering and drilling and completions morning report.

Future plans: broaden software base and increase network exposure.

ADP Autonet
175 Jackson Plaza
Ann Arbor, MI 48106
(313) 769-6800

Subsidiary of: Automatic Data Processing

Principal business:
- —on-line computer service company
- —data communications

Applications emphasis: data communications; telecommunications; packet switching; networking

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Product line: offers a packet-switched data network to companies that want to connect to a public data network. Autonet offers direct toll-freee access from more than 300 domestic locations and over 55 countries.

ADP Network Services
175 Jackson Plaza
Ann Arbor, MI 48106
(800) ADP DATA

Subsidiary of: Automatic Data Processing, Inc.

Principal business:
—on-line computer service company
—database producer
Applications emphasis: banking and finance; econometric forecasting; commodity exchange futures; interest rates; currency exchange rates; money supply and debt; financial planning; business and strategic planning; cross-tabulation analysis; graphics; financial and statistical time series; corporate financial information

President: Richard A. Patterson
Director of marketing: Gerry Geist, VP. Marketing
Date founded: 1969
Primary customers: end users such as banks, investment and accounting firms, money managers, custom house brokers, and research analysts
Sales concentration: worldwide

Product line: provides on-line services for financial management, planning, investments, economics, and analysis. Features include: financial modeling and forecasting; fixed asset management; mergers and acquisitions analysis; portfolio analysis and optimization; and corporate analysis.

Advanced Data Systems, Inc.
4010 Long Beach Boulevard
Long Beach, CA 90807
(213) 426-8155

Principal business:
—on-line computer service company
—off-line computer service company
—facilities manager
—consultants
Applications emphasis: accounting; medical and health care; payroll and personnel; sales and distribution; accounts payable; accounts receivable; general ledger

President: Dennis Christy
Date founded: 1970
No. of employees: 30
Primary customers: accounting firms, manufacturers, restaurant & hotel industry
Sales concentration: home office

Product line: provides batch and remote processing services. Available applications include accounts receivable, accounts payable, general ledger, sales analysis and forecasting, project costing, billing, and invoicing. Also provides wholesale and retail distribution, hotel management, and food service accounting for the medical and health service areas and custom software development.

Advanced Medical Systems
36 Maple Avenue
Rockville Centre, NY 11570
(516) 764-5953

Subsidiary of: RVCM Group Inc.

Principal business:
—on-line computer service company
—software vendor, selling, software for use with DEC PDP-11 and VAX 11 Series
Applications emphasis: medical and health care; patient registration and scheduling; blood bank management; medical records

President: Gerald Ehrlich
Director of marketing: Matthew Ehrlich
Date founded: 1975
No. of employees: 35; 50% devoted to on-line svcs.
Rev. last FY: $6M
Primary customers: hospitals, health care facilities
Sales concentration: home office; Los Angeles, CA; Miami, FL

Product line: provides time sharing services for applications in the health care area. Available applications include admission, discharged, transfer; out-patient scheduling; medical records; personnel; hospital encumbrance; blood bank; surgical pathology; and laboratory pharmacy and materials management. Offers real-time processing for laboratory specialization systems. The applications are also available through turnkey packages.

Allied Data
P.O. Box 2909
Olympia, WA 98507
(206) 456-3535

Subsidiary of: division of U.S. Intelco Networks

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling, software for use with IBM PC
Applications emphasis: accounting; communications; forest products industry

President: Ken F. Parsons
Director of marketing: Bob Morse
Date founded: 1967
No. of employees: 80; 33% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 80% from on-line svcs.
Primary customers: telephone industry, forest products industry
Sales concentration: home office

Product line: provides accounting, time-sharing, batch processing and computer output microfiche services, and supplies. Also provides nationwide software and time-sharing for the telephone industry. Time-sharing and

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Company Profiles—A-C

batch processing are offered for forest products applications in the Pacific Northwest. Also offers financial modeling.

Alphatext
10271 Yonge Street
Richmond Hill L4C 3B5, Canada
(416) 884-6700

Subsidiary of: Ronalds-Federated Limited

Principal business:
—on-line computer service company
—facilities manager
—electronic publishing
Applications emphasis: data management and database management; media

Date founded: 1969
No. of employees: 200; 50% devoted to on-line svcs.
Rev. last FY: $13.0M
Primary customers: Canadian federal government, Tele-Direct, General Motors, Ford, TV Guide
Sales concentration: home office; Toronto, Montréal, Edmonton, Calgary, Vancouver, Canada; Detroit, MI

Product line: offers electronic publishing from either laser printers for short-run, medium-quality works, such as internal manuals and reports, or from photocomposition systems for large, repetitive volumes or high-quality publications (e.g., directories, parts/price/rate catalogues, manuals, and reports circulating outside the company).

Altman Information Systems, Inc.
208 South LaSalle Street
Chicago, IL 60604
(312) 443-1234

Principal business:
—on-line computer service company
—database producer
—software vendor, selling, software for use with DEC 20, Hewlett-Packard, UF Technologies, Northstar
—maintenance company
—equipment vendor—minicomputer/multiuser expandable microcomputers
—other CP/M and CP/M—86 based systems
Applications emphasis: accounting; banking and finance; data management and database management; legal office accounting; investment analysis; business and strategic planning

President: Arthur P. Altman
Date founded: 1980
No. of employees: 12; 90% devoted to on-line svcs.
Primary customers: investment managers at banks and insurance companies, brokerage firms, law firms, and CPA firms
Sales concentration: home office

Product line: provides time sharing services. The company designs custom investment software for use in portfolio management, securities selection, and securities evaluations. Access is provided through FISCAL, an on-line securities database which includes pricing and financial information. Altman provides law office automation including legal time and billing, word processing, docket, litigation support and integrated accounting systems. The company also provides terminals, computer systems, software and peripherals. In addition, Altman also modifies microcomputer applications software.

American Data Services, Inc.
4550 S.W. Macadam
Portland, OR 97201
(503) 224-9110

Principal business:
—on-line computer service company
Applications emphasis: accounting; banking and finance; payroll and personnel; fixed assets; accounts payable

President: E.O. Haymond, Jr.
Date founded: 1956
No. of employees: 145
Primary customers: financial institutions, associations, and networks
Sales concentration: Oregon, California, Montana, Washington, Idaho, and Wyoming

Product line: offers remote and batch processing. Available applications in "ADBANK" include combined deposits, installment, commercial, and mortgage loans, integrated general ledger, asset/liability reporting, fully integrated central information files, COM facilities, on-line teller and telephone bill payment services. "CA$H24" ATM services include ATM driving via "strip" files or host-to-host connection. Cardholder only service is also available. Networking connections include a variety of local, regional, and national options. Complete card management services are included.

American Library Association (ALANET)
50 East Huron Street
Chicago, IL 60611
(312) 944-6780

Principal business:
—educational association
—on-line computer services company
Applications emphasis: library related information

President: Regina U. Minudri
Director of marketing: Joel M. Lee
Date founded: 1876
No. of employees: 275; 1.5% devoted to on-line svcs.
Primary customers: libraries and librarians, library suppliers, publishers
Sales concentration: North America

Product line: produces *ALANET*, an electronic mail and information service. *ALANET* offers several electronic newsletters; interactive forms for library loans and communication with library suppliers; a system-wide bulletin board; electronic mail; and access to special databases. Almost any terminal can communicate with the system,

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Company Profiles—A-C

with dial access through all major telecommunications networks now used by libraries and information centers. *ALANET* is a value-added reseller of Dialcom, Inc. products.

Future plans: expansion of *ALANET* services.

American Management Systems, Inc.

1777 N. Kent Street
Arlington, VA 22209
(703) 841-6000

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
—facilities manager
—systems integration
—consultants
—data center design
—performance analysis and capacity planning

Applications emphasis: accounting; banking and finance; data management and database management; government; legal; management sciences; mathematics and statistics; media; payroll and personnel

President: Charles O. Rossotti
Director of marketing: Paul Renard
Date founded: 1970
No. of employees: 1,700; 15% devoted to on-line svcs.
Primary customers: research and consulting firms
Sales concentration: continental U.S.

Product line: provides interactive and batch processing service through data centers in Arlington, VA. Packages offered include database management, financial planning, information retrieval, simulation, statistical analysis, and text editing. Services include time-sharing, application design, development, operations, microfilming (COM), and computer output to paper.

American People/Link

3215 N. Frontage Rd., #1505
Arlington Heights, IL 60004
(312) 870-4260

Subsidiary of: American Home Network

Principal business:
—on-line services company
—database producer

Applications emphasis: entertainment industry information

President: Jules Millman
Director of marketing: John Wheeler
Date founded: 1983
No. of employees: 30; 90% devoted to on-line svcs.
Rev. last FY: under $200,000; 100% derived from computer services business
Primary customers: personal computer users and specialized groups
Sales concentration: home computer users

Product line: provides interconnection for home computer users and hobbyists. Specialized user groups available for professionals. The database also contains an electronic mail and multi-user and real-time conversation program. The services on the database are available all over North America and Europe.

Future plans: to develop multi-user, interactive games and retail shopping.

Anacomp, Inc.

11550 N. Meridian Street, P.O. Box 40888
Indianapolis, IN 46240
(317) 844-9666

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—maintenance company
—consultants
—micrographics services

Applications emphasis: banking and finance; transaction card systems

President: Lewis P. Ferrero
Date founded: 1968
No. of employees: 2,500; 10% devoted to on-line svcs.
Rev. last FY: $172M; 50% from on-line svcs.
Primary customers: banks, credit unions, state and local government agencies, manufacturers, distributors
Sales concentration: nationwide with 90 offices

Product line: provides support systems and micrographics services for large computer users coast-to-coast and on-line transaction processing for credit unions.

Analyste-Conseil Systeme Informatique (ACSI) LTEE

969, Route De L'Eglise
Ste-Foy GIV 3V4, Canada
(418) 653-1456

Principal business:
—on-line computer service company
—off-line computer service company
—facilities management
—consultants

Applications emphasis: accounting; data management and database management; engineering and scientific; government; mathematics and statistics; payroll and personnel; sales and distribution

President: Mariel Dessureault
Director of marketing: Jean DuPuis
Date founded: 1976
No. of employees: 50; 30% devoted to on-line svcs.
Rev. last FY: $1.0M-$44.9M; 90% from on-line svcs.
Primary customers: end users
Sales concentration: Quebec; Montreal; Hull

Product line: ASCI is a service bureau offering a wide range of computing facilities including time-sharing, on-line and batch processing, custom system design, and pro-

Company Profiles—A-C

gramming, packaged software, data entry, etc. Areas of specialization include APL, statistical services, commercial applications, and CAO applications.

Applicon
P.O. Box 986, 4251 Plymouth Road
Ann Arbor, MI 48106
(313) 995-6000

Subsidiary of: Schlumberger Limited

Principal business:
—CAE/CAD/CAM system manufacturer
Applications emphasis: engineering and scientific; manufacturing

President: Bruce McCann, Vice President General Manager
Director of marketing: Jerry Robertson, Vice-President, Marketing
Date founded: 1969
No. of employees: 1,200
Rev. last FY: $50M or more
Primary customers: manufacturing industry
Sales concentration: worldwide

Product line: CAD/CAM/CAE systems for a variety of mechanical engineering and manufacturing applications, including: mechanical and electronics design, analysis, drafting, documentation, NC programming, facility layout, tool design, process planning, and fabrication. These workstations extend electronic communication to the factory floor within a manufacturer's existing environment.

Future plans: will further automate the functional tasks critical to a manufacturer's success. Included in the company's plans is the application of current research to areas such as artificial intelligence.

Applied Computer Enterprises
156 William Street
New York, NY 10038
(212) 962-4037

Subsidiary of: Lloyd Bush

Principal business:
—on-line computer service company
—computer system management
—disaster recovery
Applications emphasis: banking and finance; financial modeling; securities

President: Lloyd A. Bush
Date founded: 1971
No. of employees: 25; 30% devoted to on-line svcs.
Primary customers: financial institutions, insurance companies, cross-industry
Sales concentration: home office

Product line: provides classical time-sharing services, as well as financial analysis and proprietary services to the financial community.

Aries Information Systems, Inc.
7400 Metro Boulevard Suite 185
Minneapolis, MN 55435
(612) 835-2366

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
Applications emphasis: accounting; education; government; payroll and personnel

President: Alex Laurins
Director of marketing: Curt Swanson
Date founded: 1972
No. of employees: 22; 90% devoted to on-line svcs.
Primary customers: local governments; educational institutions
Sales concentration: home office

Product line: provides remote computing and batch processing services. Currently serving education and local governments in 23 states and 3 Canadian provinces. Additional applications include fixed asset accounting and real estate taxes.

ArKos Associates
P.O. Box 354
Idaho Springs, CO 80452
(303) 567-4238

Principal business:
—on-line computer service company
—software vendor
—consultants
Applications emphasis: medical and health care

President: Emil J. Nagy
Date founded: 1971
No. of employees: 47; 10% devoted to on-line svcs.
Rev. last FY: $200K-$499K; 10% from on-line svcs.
Primary customers: hospitals, physician's offices, clinics
Sales concentration: home office; Cleveland, OH

Product line: provides access to medical and health care applications through its data center at the home office. These applications are in the areas of nursing, surgery, emergency patient classification, quality assurance, staffing, standards, scheduling, productivity and statistical reporting, and radiology microcosting. ArKos Associates provides general business services such as accounting, management sciences, and data and database management for client in the health care fields. The software is also available for client's in-house use.

ASA Incorporated
#3 Speen Street, Pt. West Office Park
Framingham, MA 01701
(617) 872-2700

Principal business:
—on-line computer service company
—software vendor, selling, software for use with DEC VAX and PDP-11s
—maintenance company

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Company Profiles—A-C

Applications emphasis: accounting; manufacturing; sales and distribution; transportation; data collection/information management; label and bar coding

President: Christopher J. Crane
Date founded: 1969
No. of employees: 40; 100% devoted to on-line svcs.
Rev. last FY: \$1.0M-\$4.9M
Primary customers: manufacturers and distributors
Sales concentration: home office

Product line: provides in-house systems for general businesses to the New England area. ASA is a DEC distributor specializing in the sale and installation of DEC computers and software to distributors and manufacturers. Offers remote support capabilities to its users.

ASA International Limited
10 Manor Parkway
Salem, NH 03079
(603) 898-7000

Principal business:
—on-line computer service company
Applications emphasis: international trade

President: Christopher Crane
Date founded: 1976
No. of employees: 95
Primary customers: custom house brokers, international freight forwarders
Sales concentration: New York, NY; Los Angeles, CA

Product line: the largest supplier of computer services to customs brokers and freight forwarders (according to the vendor), ASA systems produce required import and export documentation, billing, accounts receivable and payable, payments verification, and general ledger. Other capabilities include ABI, Telex, data communications, tracing liquidations, missing documents, landed cost, warehousing, and TSUSA maintenance.

ASK Computer Systems, Inc.
730 Distel Drive
Los Altos, CA 94022
(415) 969-4442

Principal business:
—on-line computer service company
—software vendor, selling, software for use with Hewlett-Packard 3000 and Digital Equipment—VAX
Applications emphasis: accounting; manufacturing; graphics

President: Ronald R. Braniff
Director of marketing: David Sohm
Date founded: 1971
No. of employees: 480; 10% devoted to on-line svcs.
Rev. last FY: \$79M; 5% from on-line svcs.
Primary customers: end users, manufacturing companies
Sales concentration: nationwide; England; France; Southeast Asia; Canada

Product line: provides on-line remote processing for the ASK MANMAN Information System, which includes manufacturing management, order management and accounts receivable, accounts payable, fixed assets, payroll, project managment, bar coding, field service management, repetitive manufacturing, human resources, and general ledger. An integrated business graphics system and a general purpose report writer are also available. Provides customer support, software subscriptions, and educational services.

Aspen Systems Corporation
1600 Research Boulevard
Rockville, MD 20850
(301) 251-5000

Subsidiary of: Wolters Samsom U.S. Corporation

Principal business:
—on-line computer service company
—database producer
—information management
—database publishing
Applications emphasis: data management and database management; government; legal; management sciences

President: Albert Lampert
Director of marketing: Melvyn Goldenberg, Eugene Brannock—Unit Managers
Date founded: 1959
No. of employees: 460; 60% devoted to on-line svcs.
Rev. last FY: \$20M-\$50M; 90% from on-line svcs.
Primary customers: end users, law firms, publishers, information providers, corporations, government
Sales concentration: home office; New York, NY; Dallas, TX; Pittsburgh, PA

Product line: provides litigation file management and other database services to the legal marketplace. Aspen is a full service vendor offering such services as the acquisition, processing, management, and retrieval of documents. The company has its own on-line network, Aspenet. Aspen provides solutions to information management and dissemination problems for publishers and information providers. Services include system design, technology integration, and database development. Aspen serves the federal government through the operation of major information clearinghouses. It also provides training and technical assistance, database services, library services, and legal research to the government.

Future plans: intends to provide full electronic publishing; public database access; integrated information services for publishers; and enhanced interactive information resource management

Auto Tell Services, Inc.
600 Clark Avenue, P.O. Box 1350
King of Prussia, PA 19406
(215) 768-0200

Company Profiles—A-C

Principal business:
—on-line computer service company
—computer system manufacturer
—maintenance company
Applications emphasis: accounting; data communications; payroll and personnel; inventory control

President: Richard Schwenk
Director of marketing: Larry Sobiski
Date founded: 1967
No. of employees: 115
Rev. last FY: $10M to $19M
Primary customers: automobile and truck dealers, leasing companies, industrial plants, hospitals
Sales concentration: United States

Product line: provides turnkey systems, and on-line and remote batch processing for accounting and parts inventory control. Services include: general ledger, financial statements, journal summaries, management reports, inventory reports, finance, insurance, service merchandising, and service dispatching. The in-house computer system is programmed and maintained for dealership applications. Also provides turnkey microcomputer systems for plant maintenance planning, scheduling, and controlling. Services include: maintenance management systems, and parts inventory control of spare parts required for plant or institution operation.

Autocomp
P.O. Box 532
Fond du Lac, WI 54935
(414) 923-5514; (414) 922-5900

Principal business:
—on-line service company
—database producer
Applications emphasis: automotive; education; engineering and scientific; transportation

President: D. Bates
Director of marketing: Pat Daly
Date founded: 1985
No. of employees: 3; 100% devoted to on-line svcs.
Rev. last FY: under $200,000; 100% derived from computer svcs.
Primary customers: automotive dealers
Sales concentration: nationwide

Product line: producers of the *Autocomp* database. The database covers automotive-related subjects such as automotive systems, repairs, service advice, and component parts.

Automated Information Inc.
6710 Clayton Road
St. Louis, MO 63117
(314) 644-4050

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
—computer system manufacturer
—digital Computer distributor and Century Data Systems distributor
Applications emphasis: accounting; legal; management sciences; manufacturing; payroll and personnel; sales and distribution; transportation

President: Robert Love
Director of marketing: Anthony Ruggeri
Date founded: 1969
No. of employees: 120; 30% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 70% from on-line svcs.
Primary customers: small to large business companies & organizations
Sales concentration: home office

Product line: provides time-sharing, batch processing, word processing, data entry, systems design, feasibility studies, programming, and turnkey systems. Services range from general ledger accounting to modeling and forecasting.

Automated Medical Systems, Inc.
841 Chestnut Street, Suite 1310
Philadelphia, PA 19107
(215) 923-1010

Principal business:
—on-line computer service company
—turnkey computer service company
—consultant to health care professionals
Applications emphasis: medical and health care; medical billing procedures; medical office accounting

President: G. William Carlson
Director of marketing: John A. Quatrini
Date founded: 1977
No. of employees: 50; 80% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 80% from on-line svcs.
Primary customers: health care professionals; all specialties; hospital and private practices.
Sales concentration: home office and 20 dealers throughout th U.S.

Product line: provides billing/practice management services to health care professionals and outpatient clinics. Medical consultant developed system has flexibility to handle demands ranging from from solo practitioners to largest clinics. Latest TEFRA and DRG requirements are accommodated. AMS provides cost-effective batch services, as well as on-line systems. On-line options include an on-site terminal, or a microcomputer with up to 32 workstations. The system provides tape-to-tape billing and payment posting with Medicare, Medicaid, and Blue Shield. It also features transaction controls to eliminate lost charges and assure that all payments are posted. It offers numerous other capabilities, and can be totally customized. By specifying decision rules, the system automatically determines who and when to bill, for which services, and optimal amount. Typical user benefits include reduced receivables and staff workloads, and improved cash flow and patient sevices.

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Company Profiles—A-C

Automatic Data Processing, Inc. (ADP)
One ADP Boulevard
Roseland, NJ 07068
(201) 994-5000

Principal business:
- —on-line computer service company
- —off-line computer service company

Applications emphasis: accounting; banking and finance; data communications; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; sales and distribution; real estate management; automotive; securities

President: Josh S. Weston
Date founded: 1949
No. of employees: 16,000
Rev. last FY: $750M or more; 100% from on-line svcs.
Primary customers: cross-industry
Sales concentration: worldwide

Product line: provides computing services primarily through computer centers. The services are offered via batch processing, on-line processing, and on-site installations. The Commercial Services Group offers batch, on-line, and on-site employer services, accounting services, and services that are designed for use by manufacturers, and wholesalers and distributors. The Brokerage Processing Group provides front- and back-office processing to brokerage and commodities services clients. Network Services offers specialized computing services, application programs, and general time-sharing in the financial and economic areas. Automotive industry services include total computing systems for dealerships from parts inventory control to direct communications links to manufacturers. Services provided to banks and thrifts include Automated Teller Machine (ATM) support, accounts processing services, telephone bill paying, and home banking services. Other services include automotive collision repair estimating, medical benefits administration service, and real estate management computing services. ADP's Autonet division provides the company and its clients with a teleprocessing and communications network.

Automation, Inc.
10703 J Street
Omaha, NE 68127
(402) 339-9500

Principal business:
- —on-line computer service company
- —off-line computer service company
- —electronic publishing

Applications emphasis: accounting; payroll and personnel; order processing; inventory control; accounts receivable; accounts payable; financial reporting; cost accounting; sales analysis; billing/invoicing/collection

President: Michael Gregory, Vice-President and General Manager
Date founded: 1957
No. of employees: 40; 15% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 65% from on-line svcs.
Primary customers: cross-businesses
Sales concentration: home office

Product line: provides batch and time-sharing accounting applications. The packages are order entry; invoicing; inventory; accounts receivable; accounts payable; financial reporting; sales analysis; payroll; job costs; municipal financial services; Fleetfax-a transportation management system; and electronic publishing. The company also provides custom programming for business applications; laser page printing services; high-speed computer output; and personalized letters. Automation, Inc. also offers Unisys PC and micro products.

AYA Associates Inc. (AAI)
275-277 Forest Avenue
Paramus, NJ 07652
(201) 967-0770

Principal business:
- —on-line computer service company
- —mini/micro computer software/hardware integrator
- —software vendor, selling software for use with IBM System 36 series; NEC ASTRA minicomputer; Texas Instruments terminals; IBM PC; NEC APC; Altos

Applications emphasis: banking and finance; data communications; data management and database management; government; media; medical and health care; retail industry information

President: Edgar H. Aya
Director of marketing: Leonard Bernstein
No. of employees: 23; 20% devoted to on-line svcs.
Rev. last FY: $1.0M-4.9M; 90% from on-line svcs.
Primary customers: software companies, publishing companies, banks, retail chain stores, ceramic tile chains, retail jewelery stores
Sales concentration: home office

Product line: provides time-sharing and on-line communications support. Other services include: resource management; minicomputer sales; minicomputer installation, support, and customized system development; contract programming; and management consulting as it relates to computer systems and procedures.

Future plans: intends to expand to vertical software for microcomputers in ceramic tile, retail jewelry stores, and banking.

Aztech Corporation
1621 Connecticut Avenue, N.W.
Washington, DC 20009
(202) 232-5500

Principal business:
- —on-line computer service company

Applications emphasis: accounting; fund raising; file management; mailing list generator; word processing; subscription fulfillment

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Company Profiles—A-C

President: John W. Rollins, Jr.
Director of marketing: W. Douglas Fisher
Date founded: 1968
No. of employees: 40; 20% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 40% from on-line svcs.
Primary customers: membership groups, associations, societies, fund raisers, publishers
Sales concentration: home office

Product line: provides computer service and turnkey computer systems. Primary applications include membership, mailing list, accounting, word processing, conference registration, and subscription fulfillment. The company's service bureau uses Data General equipment for on-line, interactive processing. IBM and Nixdorf equipment is used for batch and on-line transaction processing. Installs Data General microcomputer and minicomputer systems for in-house users. Aztech Corporation also offers association software packages for IBM-PCs and compatibles.

Future plans: intends to expand applications packages for both on-line and turnkey systems.

B-H Computer Systems, Inc.
14 S. Belmont Street
York, PA 17405
(717) 843-0926

Subsidiary of: Pace Resources, Inc.

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM 360/433
—facilities manager
—utility billing
Applications emphasis: accounting; data communications; engineering and scientific; manufacturing; medical and health care; payroll and personnel; sales and distribution; utility management

President: Robert E. Horn, Vice President
Date founded: 1970
No. of employees: 25; 60% devoted to on-line svcs.
Primary customers: distributors, nursing homes, cities & boroughs, manufacturers
Sales concentration: home office

Product line: offers batch and on-line services for accounting applications as well as local government applications such as sewer and water billing. Also distributes two lines of turnkey minicomputer systems. Provides standard packages and modifications to standard or custom packages.

The Babcock & Wilcox Company
3315 Old Forest Road, P.O. Box 10935
Lynchburg, VA 24506-0935
(804) 385-2000

Subsidiary of: McDermott Inc.

Principal business:
—on-line computer service company
—software vendor, selling primarily engineering and scientific software especially for electric power utilities
Applications emphasis: engineering and scientific; mathematics and statistics; structural engineering; nuclear engineering; civil engineering; graphics

President: Dr. C.W. Pryor
Director of marketing: J.J. Bird
Date founded: 1971
No. of employees: 1,200; 5% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M; 98% from on-line svcs.
Primary customers: electric utilities, technical consultants, manufacturers, architect-engineers, engineering consultants, actuaries
Sales concentration: primarily east, south, and midwest U.S.; brokers in Japan and Canada

Product line: provides time-sharing and remote batch computer service for nuclear analysis; nuclear fuel management and analysis; structural and piping analysis; fluids and thermal-hydraulics analysis; statistics; mathematics; and graphics. Other services include engineering and scientific applications software, technical software development, and software verification and validation.

Barter Worldwide Inc.
6033 W. Century Blvd. 4th fl.
Los Angeles, CA 90045
(213) 641-1000; Telex 466807

Principal business:
—on-line computer service company
—database producer
—barter brokerage
Applications emphasis: accounting; banking and finance; data communications; engineering and scientific; insurance; legal; management sciences; media; medical and health care; payroll and personnel; facility design and management

President: Mike Jeffries
Date founded: 1980
Primary customers: Fortune 1000 Corporations
Sales concentration: worldwide sales from home office

Product line: operates the International Business Clearinghouse (IBC) on-line service. This is designed to arrange and expedite worldwide selling, buying, or exchanging transactions. IBC provides potential traders with daily information on goods/services up for sale or exchange, and includes electronic mail and telex services for transferring documents, contracts, and specifications of the sale.

Batsch Spectracomp
5170 E. Trindle Road
Mechanicsburg, PA 17055
(717) 697-8600

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Company Profiles—A-C

Principal business:
—on-line computer service company
—database typesetting
Applications emphasis: typesetting

President: Terry E. Fackler
Date founded: 1964
No. of employees: 25; 50% devoted to on-line svcs.
Rev. last FY: $500K-$999K; 50% from on-line svcs.
Primary customers: end users requiring typesetting from an existing database.
Sales concentration: home office

Product line: provides typesetting to the printing and publishing trade, colleges, governmental agencies, and the private sector. Receives data from the customer and translates it through interface with the Batsch Spectrocomp database for phototypesetting. The phototypesetting commands automatically generate into the file and output to digitized phototypesetting equipment. Customer's input can be received in two ways: 1) Batsch interfaces with the client's equipment, utilizing existing media supplied by the customer, and reading them into the phototypesetting computer and 2) documents are sent electronically over the telephone from the customer's word or data processor into the typesetting computer at 300, 1200, or 2400 baud.

Future plans: intends to expand into remote locations by the sale of franchises to word processing and data processing operations.

BMA Data Processing, Inc.
1174 East 2700 South
Salt Lake City, UT 84106
(801) 487-8991

Subsidiary of: Central Bank & Trust

Principal business:
—on-line computer service company
Applications emphasis: accounting; banking and finance

President: Paul W. Evans
Director of marketing: J. Wayne Webb
Date founded: 1955
No. of employees: 81; 100% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 100% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides standard programs for banking and finance and all major accounting applications. BMA features a fully integrated accounting system with all applications posting automatically to the general ledger. The system is on-line, real-time with a one-time handling of the source document. The sales concentration is mainly in the western states.

Future plans: intends to increase concentration of EFT and on-line network facilities, including remote printers at customer locations.

Boeing Computer Services Company
7980 Boeing Court
Vienna, VA 22180
(703) 821-6505

Subsidiary of: a division of Boeing Company

Principal business:
—systems integration
—telecommunications systems
—interactive and remote computing
—software vendor
—consultants (systems engineering)
Applications emphasis: government; manufacturing; energy; engineering and scientific; mathematics and statistics; data management and database management; sales and distribution; graphics; utility management; econometric forecasting; environment; structural engineering; nuclear engineering; civil engineering; financial modeling

Date founded: 1970
No. of employees: 10,000
Primary customers: government, manufacturing companies, energy related companies
Sales concentration: worldwide

Product line: provides a full range of information services. Boeing Computer Services Company also provides systems development; facilities management; professional services; education and training; and communications network design and management.

Bonner & Moore Computing Co.
2727 Allen Parkway
Houston, TX 77019
(713) 522-6800

Subsidiary of: Bonner & Moore Associates

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM 4300/370/30XX; Data General Eclipse MV/800, MV/10000
—facilities manager
—laser printing
—consultants
Applications emphasis: accounting; manufacturing; sales and distribution; inventory control; oil and gas accounting procedures; electronics

President: Jim C. Green
Director of marketing: Dick Stuart
Date founded: 1957
No. of employees: 100; 30% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M; 50% from on-line svcs.
Primary customers: cross-industry
Sales concentration: home office

Product line: provides time-sharing services accessing a software library of over 200 proprietary applications. The applications include oil and gas accounting, linear

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Company Profiles—A-C

programming, inventory control, general financial packages, and electronic publishing. The software packages are also available for in-house use.

Bowne Information Systems, Inc.

400 Oser Avenue
Hauppauge, NY 11788
(516) 231-0333

Principal business:
—on-line computer service company
Applications emphasis: engineering and scientific; government; legal; construction; word processing; mailing list generator; records management

President: Robert K. Galuin
Director of marketing: Robert A. Cohn
Date founded: 1969
No. of employees: 100; 85% devoted to on-line svcs.
Rev. last FY: $10M-$19M; 50% from on-line svcs.
Primary customers: data processing managers, construction specifiers, attorneys, corporate end users
Sales concentration: home office; Washington, DC; San Francisco, CA; Chicago, IL

Product line: provides on-line text processing and maintains SPECTEXT, the master specification from the Construction Specifications Research Foundation (CSRF) on Magnetic Media for over 160 microcomputers and word processing systems. The company also provides database typesetting, database printing, and demand printing.

Bradford National Computer Services, Inc.

1500 Palisade Avenue
Teaneck, NJ 07666
(201) 833-1020

Subsidiary of: Bradford National Corporation

Principal business:
—on-line computer service company
—off-line computer service company
—facilities manager
—consultants
Applications emphasis: accounting; banking and finance; data communications

President: David G. Williams
Director of marketing: Vincent J. Iuzzolino, Director of Sales
Date founded: 1972
No. of employees: 145; 100% devoted to on-line svcs.
Rev. last FY: $7.0M-$12M; 100% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides a nationwide data communications network of leased and dial-up lines which support interactive and remote job entry (RJE) traffic. Primary services include time, time-sharing, systems, and development to be run on the host computer or remotely at a client's site. Client's access the system via in-office CRT terminals. Conversions, system generations, and disaster backup services are also offered.

Brant Computer Services Limited

615 Brant Street
Burlington, Ontario L7R 2G6, Canada
(416) 632-1386

Principal business:
—on-line computer service company
Applications emphasis: accounting; data communications; data management and database management; education; government; legal; manufacturing; sales and distribution; facility design and management; inventory control; order processing; job cost accounting

President: Bruce C. Lyons
Director of marketing: Bob Mutch
Date founded: 1969
No. of employees: 55
Rev. last FY: $3M
Primary customers: mid-size manufacturing companies; government agencies; distributors
Sales concentration: Canada

Product line: a Canadian-owned computer utility company providing a shared source of power accessed through the public telephone systems, on a "pay-as-you-grow" basis. By utilizing this time-sharing environment, businesses can have the power and capabilities of Brant's Hewlett-Packard HP3000 computers without initial capital outlay or on-going overhead costs. Brant also distributes software packages, including Powerhouse, DollarFlow, MProlog, SpeedWare, Work-In-Progress, Inventory/Order Entry and the MCBA packages.

Future plans: office Ottawa; also plans to expand software and support services on HP3000.

British Library Bibliographic Services Division

2 Sheraton Street
London W1V 4BH, England
(01) 323-7077

Principal business:
—on-line services company
—database producer
—software vendor
Applications emphasis: education; library information systems

President: P.R. Lewis, Director General
Director of marketing: Tony McSean
Date founded: 1974
No. of employees: 181
Primary customers: libraries
Sales concentration: United Kingdom

Product line: The British Library Bibliographic Services has two main functions: to provide bibliographic records to the other divisions of the British Library and to supply bibliographic services to support the whole network of libraries in the United Kingdom. BLBS offers access through the BLAISE-LINE service to a number of data-

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Company Profiles—A-C

bases produced or maintained by the British Library, which contains detailed cataloging information in MARC format. For subscribers in the United Kingdom and Ireland it also offers access to the on-line biomedical files of the U.S. National Library of Medicine, through the BLAISE-LINK service.

Broker Services, Inc.
5950 S Willow Drive, #206
Englewood, CO 80111
(303) 779-8930

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: accounting; banking and finance; payroll and personnel; securities; investment analysis

President: James Donahue
Director of marketing: James Donahue
Date founded: 1976
No. of employees: 4; 75% devoted to on-line svcs.
Primary customers: national security dealers
Sales concentration: home office

Product line: provides on-line time-sharing for financial stock market analysis and investment analysis. Also provides accounting and payroll applications. Users access the information via printer terminals through the Telenet communications network.

Bunker Ramo Information Systems
35 Nutmeg Drive
Trumbull, CT 06609
(203) 386-2818

Principal business:
—on-line computer service company
—database producer
—bank branch automation supplier
Applications emphasis: banking and finance; commodities; securities; stock information; investment management; investment analysis

President: Robert Amman
Director of marketing: Michael Cooper, V.P.
Date founded: 1929
No. of employees: 1,200; 100% devoted to on-line svcs.
Rev. last FY: $50M or more
Primary customers: brokerage firms; commercial banks; thrift institutions
Sales concentration: New York, NY; Chicago, IL; Long Beach, CA; San Francisco, CA; and Atlanta, GA; Dallas, TX

Product line: Bunker Ramo is a supplier of on-line, real time computer and branch automation systems and services for use in banks, thrift institutions and brokerage firms. The ALADDIN bank branch automation system provides comprehensive, on-line transaction processing capabilities for teller and administrative functions through the BANKTRAN and ADTRAN applications software. The software can be easily customized for an institution by bank personnel with the Transaction Generator. Financial and stock quotation information is supplied to customers via Bunker Ramo's nationwide network which connects to its Market Decision System-7 database. The database is a real-time price retrieval service for securities and commodities traded on exchanges and over-the-counter in the U.S. and Canada.

Future plans: microcomputers, office automation

Burns Computing Services, Inc.
10 Gould Center, Suite 722
Rolling Meadows, IL 60008
(312) 981-5260

Principal business:
—on-line computer services company
Applications emphasis: accounting; sales and distribution; data management and database management; manufacturing; payroll and personnel; materials management

President: Frank J. Burns
Director of marketing: William Helzing
Date founded: 1983
No. of employees: 40; 100% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M
Primary customers: manufacturing companies
Sales concentration: Chicago; Midwest; Philadelphia; New York; Pennsylvania; national

Product line: provides IBM mainframe services under MVS, DOS/VSE and VM to remote users. Software includes Millennium Financial systems and NOMAD2 Fourth Generation language.

Future plans: controlled growth with emphasis on providing fourth generation software and state-of-the-art business applications

Business Applications Group
9619 Chesapeake Drive, Suite 105
San Diego, CA 92123
(619) 560-6343

Principal business:
—on-line computer service company
—off-line computer service company
—consultants
Applications emphasis: accounting; job cost accounting; labor force information; retail industry information

President: Del Hickman
Director of marketing: Jim Clark
Date founded: 1974
No. of employees: 8
Primary customers: financial, insurance, manufacturing, retail, construction industries
Sales concentration: home office

Product line: provides time-sharing, remote, batch processing, and data entry services. Available applications include sales analysis and forecasting, labor distribution, project costing, time reporting, inventory control, prod-

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Company Profiles—A-C

uct costing, property management, bill of material processing, accounts receivable, accounts payable, and general ledger. Offers custom software development.

Business Information Systems, Inc.
5128 N. Elston Avenue
Chicago, IL 60630
(312) 685-7130

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: accounting; financial reporting; time accounting

President: Albert C. Wagner
Director of marketing: Michael Cernauske
Date founded: 1967
No. of employees: 27; 50% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 100% from on-line svcs.
Primary customers: public accountants

Product line: provides a financial reporting system for public accounting firms. Offers flexible formats for financial statements, presentations, and interpretations. The company also provides a time accounting system for accountants, lawyers, architects, and similar professions. The services are available via remote computing and also through data transmission services.

Future plans: plans to expand sales offices to additional major cities.

Business Systems Inc.
9845 W. Roosevelt Road
Westchester, IL 60153
(312) 681-6060

Principal business:
—off-line computer service company
—REXON dealer
—software vendor, software available for use with REXON family of microcomputers
Applications emphasis: accounting; medical and health care

President: Clyde Scott
Director of marketing: Bill Biggs
Date founded: 1971
No. of employees: 100
Rev. last FY: $1.0M-$4.9M
Primary customers: medical clinics, pharmacies, and cross-industry
Sales concentration: home office; Joliet, IL

Product line: provides batch processing services. Applications are available for medical billing, accounting, and pharmacy prescription processing and accounting. The applications are also available for in-house systems. Business Systems Inc. is also a distributor for Digital Techniques, Inc. and TOUCHCOM Computer Systems.

Call Computer
1961 Old Middlefield Way
Mountain View, CA 94043
(415) 964-5331

Principal business:
—on-line computer service company
Applications emphasis: computer related information

President: Alex Kamradt
Date founded: 1970
No. of employees: 10; 100% devoted to on-line svcs.
Primary customers: doctors, lawyers, end users
Sales concentration: home office

Product line: provides timesharing services. Customers access the computer via telephone lines. The clients program their own applications into the Call Computer's system. Currently serving users in Mountain View and the surrounding area.

Canada Systems Group
955 Green Valley Crest
Ottawa K2C 3V4, Canada
(613) 727-5445

Principal business:
—on-line computer service company
—industry-specific processing and professional services
Applications emphasis: accounting; banking and finance; data management and database management; engineering and scientific; insurance; management sciences; mathematics and statistics; sales and distribution; oil and gas exploration; financial planning

President: John F. Ricketts
Date founded: 1971
No. of employees: 1,500; 75% devoted to on-line svcs.
Rev. last FY: $50M or more; 80% from on-line svcs.
Primary customers: end users in industry, government and commercial environments
Sales concentration: nationwide in Canada and United States

Product line: provides interactive computing and remote batch processing. Available output includes computer-output microfilm (COM) facilities management, and laser printing. Industry-specific services include engineering applications, financial planning, management sciences, and engineering graphics to scientific and engineering clients; income tax processing to chartered accountants; processing and administrative services to banking, brokerage, insurance, and investment clients (these services include Term Notes, Investment Plan processing, Order Management processing, PALM, POLISY, on-line banking, and mortgate administration); proprietary database services, including DUNSKEY, demographics, Canadian trademarks and patents, and CHOICES; business accounting to manufacturers and distributors; high technology minicomputer applications, such as taxi dispatch systems and process flow monitoring systems; and turnkey systems to manufactur-

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ing, property management, retail, and distribution clients. Professional services include data processing consulting, project management, technical support, systems design, programming, implementation, and production support.

Canton Automated Systems, Inc.
100 Central Plaza South, P.O. Box 110
Canton, OH 44701
(216) 489-3738

Subsidiary of: Citizens Savings Bank

Principal business:
—on-line computer service company
—software vendor
—facilities manager
Applications emphasis: accounting; banking and finance; data management and database management

President: Larry Machan
Director of marketing: Ronald H. Arnold
Date founded: 1965
No. of employees: 100
Rev. last FY: $1.0M-$4.9M
Primary customers: thrift institutions, banks
Sales concentration: home office

Product line: provides complete real time processing of all types of customer accounts; deposits; loans; EFT accounts; all completely integrated with general ledger accounting and customer information system. The servicer provides low cost, flexible service from the same software product used by many large in-house installations. Optional services include menu-driven teller/platform system, marketing, CIF, and database extracts downloaded to customers' PCs and/or minicomputers.

Future plans: establishment of additional Regional Data Centers throughout the country.

Cards Inc.
316 Main Street
Elida, OH 45807
(419) 331-3060

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with Data General Systems
—computer system dealer for TeleVideo microcomputers
—maintenance company
—consultants

President: Mark Kitson
Date founded: 1963
No. of employees: 45
Rev. last FY: $1.0M-$4.9M
Primary customers: courts and county agencies
Sales concentration: Ohio

Product line: provides time-sharing and batch processing services; large volume data entry services; plus computer sales, installation, custom and package programming, training, and support.

Care Computer Systems
P.O. Box 1408
Bellevue, WA 98009
(206) 451-8272

Principal business:
—off-line computer service company
—software vendor, selling software for use with Datapoint Family of minicomputers, IBM PC XT and PC AT
—maintenance company
—distributed processing service
Applications emphasis: accounting; medical and health care
Date founded: 1969
No. of employees: 125
Primary customers: small hospitals, nursing homes, long-term health care
Sales concentration: nationwide

Product line: provides shared processing, batch processing services, and turnkey products for accounting and patient management in the long-term health care industry. Features on-going support and new release (added enhancements) services.

CB Automatisering
Laan van Malkenschoten 20
7333 NP Apeldoorn, The Netherlands
055 792121

Principal business:
—database producer
—off-line computer services company
—software vendor
—facilities manager
—computer system manufacturer
—maintenance company
Applications emphasis: accounting; data communications; data management and database management; manufacturing; medical and health care; payroll and personnel; sales and distribution

President: M. Minderhoud
Director of marketing: J.A. Berkman (Business and Government; C.F.H. deBos (Accounting); J.A.M. Rutges (Medical and Health care)
Date founded: 1960
No. of employees: 300
Rev. last FY: $20M-$50M; 70% from on-line svcs.
Primary customers: accountants, notaries, medical and health care institutions, trade and business institutions
Sales concentration: home office; Apeldoorn, subsidiaries Rotterdam; Amsterdam; Eindhoven

Product line: provides off-line services, software development, turnkey solutions, database services, and software for microcomputers.

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Company Profiles—A-C

CCMI/McGraw-Hill
50 S. Franklin Turnpike
Ramsey, NJ 07446
(201) 825-3311

Subsidiary of: McGraw-Hill

Principal business:
—on-line services company
—database producer
Applications emphasis: data communications; telecommunications; tariff information

President: Peter McCuen
Director of marketing: Jeremy Van Pelt, VP of Marketing
Date founded: 1970
No. of employees: 95; 80% devoted to on-line svcs.
Rev. last FY: $1.0M-$5.0M; 75% derived from computer svcs.
Primary customers: U.S. and Canada with four regional offices

Product line: supplies through publications and databases a comprehensive program of telecommunications rates and service data. The company's guides and newsletters contain up-to-date rates and tariffs, as well as, all the pertinent information of the telecommunications industry. Databases are available as an on-line service—*Q-Tel 1000*; as a customized database—*Q-TEL 5000*; and a master database—*Q-TEL 9000.*

Future plans: introducing a line of PC—based packages for the telecommunications industry.

CCX Network, Inc.
301 Industrial Blvd.
Conway, AR 72032
(501) 329-6836

Principal business:
—on-line service company

Applications emphasis: direct mail; marketing

President: R.P. Carter
Director of marketing: Don W. Barrett, Jr.
Date founded: 1969
No. of employees: 350
Rev. last FY: $10M-$19M
Primary customers: direct marketing companies
Sales concentration: Washington, DC and New York, NY

Product line: provides a computer-based, decision-support network and related data processing services to direct marketing organizations. These organizations use direct mail and telephones to reach consumers and businesses.

Future plans: continued investment in technological and personnel resources in order to maintain its leadership position in the direct marketing industry.

Chase Econometrics
150 Monument Road
Bala Cynwyd, PA 19004
(215) 667-6000

Subsidiary of: Chase Manhattan Bank

Principal business:
—economic consulting
—on-line computer services company
—database producer
Applications emphasis: accounting; banking and finance; data management and database management; government; insurance; legal; manufacturing; media; transportation; economics; corporate planning; metals; agriculture; energy; utility management; construction; real estate management

President: Lawrence Chimerline, Chairman
Director of marketing: Dennis Steadman, V.P.
Date founded: 1971
No. of employees: 225
Primary customers: economists; corporate planners; marketing executives
Sales concentration: 7 offices in North America; 5 offices in Europe; 2 office in the Far East

Product line: provides decision support services to major corporations and financial institutions, as well as national, state, and local government concerns. Primary services include national, international, regional, and industry databases and forecasts. The company also provides application facilities on both the mainframe and microcomputer.

Future plans: to develop PC workstations to facilitate the decision making activities of planning executives.

Chemical Data Center, Inc.
3620 North High Street
Columbus, OH 43214
(614) 261-7101

Principal business:
—on-line computer service company
—chemical consulting and chemical information services
—marketing research information, analysis and reports
Applications emphasis: engineering and scientific; manufacturing; medical and health care; bibliographic research; chemistry related information

President: Kenneth E. Jackson
Date founded: 1973
No. of employees: 5; 70% devoted to on-line svcs.
Rev. last FY: under $200,000; 80% from on-line svcs.
Primary customers: chemical and related fields
Sales concentration: nationwide

Product line: provides on-line bibliographic searches, manual literature searches, and document retrieval services.

Chemical Exchange Directory
Rue de la Gabelle, 9
CH-1227 Geneva, Switzerland
(022) 42.20.70

Subsidiary of: ADIA International

Principal business:
—on-line services company
—database producer

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Company Profiles—A-C

Applications emphasis: chemicals; chemistry related information; sales and distribution; marketing

President: Rainer Kettenacker, Managing Director
Director of marketing: Dr. Douglas Mowat
Date founded: 1985
No. of employees: 4; 100% devoted to on-line svcs.
Primary customers: chemical producers, chemical consumers
Sales concentration: worldwide

Product line: serves the chemical and chemical-related industries. The primary service is intended to bring chemical buyers and sellers into contact on an international scale through on-line product information service. Supplier information is also offered as internal product catalogs. In addition, the company markets a consultancy service to the same industry. CED is staffed by chemical professionals.

Future plans: plans to supply chemical industry-specific communications services, e.g. bulletin boards and specialized electronic mail.

ChemShare Corporation

P. O. Box 1885
Houston, TX 77001
(713) 627-8945

Subsidiary of: Texas-McCan

Principal business:
- on-line computer service company
- database producer
- software vendor, selling software for use with IBM, OS or DOS, ICL, CDC, DEC-VAX, Prime, Univac, and Micros

Applications emphasis: engineering and scientific; chemistry related information

President: Dr. Michael McGuire
Director of marketing: Ken Lucas
Date founded: 1969
No. of employees: 25; 25% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M; 50% from on-line svcs.
Primary customers: oil, gas, chemical operating companies and engineering companies; pharmaceutical companies
Sales concentration: worldwide

Product line: produces the Mixmaster database which contains over 10,000 sets of vapor-liquid equilibrium data for approximately 1,200 chemicals. ChemShare also develops the software for process simulation for calculating heat and material balances which is used in refineries, gas plants, chemical plants, and all the engineering construction firms supporting these operating companies. This software is available on ChemShare time-sharing computer systems, as well as installed on large in-house computers and microcomputers.

CISI

35 Boulevard Brune
75680 Paris, France
(1) 4545-8000

Principal business:
- on-line computer service company
- software vendor, microcomputer

Applications emphasis: accounting; banking and finance; data management and database management; engineering and scientific; government; legal; management sciences; mathematics and statistics; payroll and personnel; sales and distribution; construction; real estate management; financial modeling; project management; energy; facility design and management
Date founded: 1972
No. of employees: 3,000; 50% devoted to on-line svcs.
Rev. last FY: $50M or more
Sales concentration: worldwide

Product line: offers timesharing, remote batch and batch processing services. Both centers are accessible nationwide from terminals via a dedicated network that is supplemented by Tymnet's facilities. CISI sells and leases its own proprietary software and is converting many of its packages to run on microcomputers, either off-line or using data and programs downloaded from its central computer. CISI acquired UNI-COLL in 1980. CISI established first in France but expanded to Europe, North America and Africa.

Citicorp Electronic Securities Services

641 Lexington Avenue, 7th Floor
New York, NY 10043
(800) 241-2476

Subsidiary of: Citicorp

Principal business:
- on-line service company
- database producer

Applications emphasis: banking and finance; insurance

President: Edward J. Burchianti
Director of marketing: Kenneth Cirillo
Date founded: 1984
No. of employees: 100
Rev. last FY: $50M or more
Primary customers: securities brokerages, pension fund managers, investment advisors
Sales concentration: worldwide

Product line: the company has developed a service called *StreetSense* that provides real-time market data, analysis, and other entry/inquiry capabilities to banking and brokerage, and personal investment clients.

Future plans: to enhance *StreetSense* by adding realtime news services, foreign securities data, and expanded analytical and display capabilities.

Citicorp Information Resources

1080 Cherokee
Denver, CO 80204
(303) 534-6622

Subsidiary of: Citicorp

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Company Profiles—A-C

Principal business:
- on-line computer service company
- off-line computer service company
- facilities manager

Applications emphasis: banking and finance

President: Rosemary Green, General Manager
Director of marketing: Reed Myer
Date founded: 1969
No. of employees: 157; 15% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M; 100% from on-line svcs.
Primary customers: commercial and industrial banks, savings and loans
Sales concentration: home office

Product line: provides on-line and batch processing services to banks and savings and loans in the Rocky Mountain area. Offers a customer information file and on-line inquiry, file maintenance, memo post and monetary post on all applications. Also provides on-line capabilities for remote proof operations.

Cogito Data Systems, Inc.

90 Wall Street
Princeton, NJ 08540
(609) 924-7200

Principal business:
- on-line computer service company
- database producer
- off-line computer service company
- software vendor, selling software for use with Convergent technologies.

Applications emphasis: education; transportation; petroleum; automotive

President: Frank Gunther
Date founded: 1968
No. of employees: 210; 100% devoted to on-line svcs.
Rev. last FY: $5.0M-$9.9M; 100% from on-line svcs.
Primary customers: secondary schools; vehicle fleet management; fuel oil dealers
Sales concentration: Princeton, NJ; Mountain View, CA; Los Angeles, CA; Greensboro, NC; Toronto, Canada

Product line: specializes in selected vertical markets, including secondary school administration, vehicle fleet maintenance, and fuel oil retailers. In each market, Cogito provides services & products needed to run that business. Delivery methods include on-line service, batch service, and turnkey super-micro systems. Marketing and support are done through subsidiaries and divisions. Petrodata addresses oil dealers; Cogito Corporation provides services for schools; and Mainstem Corporation and Automated Fleet Services specialize in vehicle fleets.

Future plans: to remain the leader in each of the markets through new products and enhancements to existing ones.

Columbia Computing Services, Inc.

8611 South 212th Street
Kent, WA 98031
(206) 872-0283

Subsidiary of: Columbia Computing Services Ltd.

Principal business:
- on-line computer service company
- software vendor

Applications emphasis: education

President: Robert M. Delf
Director of marketing: Robert M. Delf
Date founded: 1968
No. of employees: 30; 100% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 80% from on-line svcs.
Primary customers: public schools
Sales concentration: national

Product line: provides a fully integrated student and school record management system, comprising scheduling, mark reporting, attendance, academic history and transcripts, demographic data maintenance, general reporting, and various related applications. System supports on-line inquiry, on-line or batch update, and is available as a software product for installation on customers computers or via Columbia's service bureau. Comprehensive documentation includes user, operations and program logic manuals.

Future plans: intends to continue specializing in software for school administration.

Combustion Engineering

1000 Prospect Hill Road
Windsor, CT 06095
(203) 285-9194

Subsidiary of: C-E Power Systems

Principal business:
- on-line services company
- equipment supplier for energy related industries

Applications emphasis: engineering and scientific; mathematics and statistics; transportation; energy; civil engineering

President: Charles E. Hugel
Director of marketing: William H. Wolfe
Date founded: 1912
No. of employees: 30,000
Primary customers: utilities and consultants
Sales concentration: nationwide

Product line: offers an on-line computer service that emphasizes applications in engineering, physics, and mathematics including statistics and probability risk assessment. The company's mainframe CDC and IBM computers are based in Windsor, CT and are accessible through TYMNET and local dial-up service. A software library of over 200 computer codes is available. Training programs to enable clients to effectively use these codes are also available.

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Company Profiles—A-C

Comcheq Services Ltd.

298 Garry Street
Winnipeg, R3C 1H3, Canada
(204) 947-9400

Principal business:
- —on-line computer service company
- —software vendor, selling software for use with Cyber mainframe and with the IBM PC

Applications emphasis: data communications; payroll and personnel

President: John P. Loewen
Director of marketing: John Angus
Date founded: 1968
No. of employees: 250; 10% devoted to on-line svcs.
Rev. last FY: $10M-$19M; 80% from on-line svcs.
Primary customers: all companies
Sales concentration: Canada

Product line: provides computerized payroll checks to any company for a monthly fee. The company can be any size from 1 employees to 10,000 employees. The company also has the service of remote data entry from a microcomputer or dumb terminal, called Micropay and Telpay for the usage of dumb terminals.

Future plans: to expand in the same area.

Commodity Communications Corporation

250 S. Wacker Drive, Suite 950
Chicago, IL 60606
(312) 977-9067

Subsidiary of: Oster Communications

Principal business:
- —on-line services company

Applications emphasis: commodities; stock information; investment reporting

President: Gene Dixon
Director of marketing: Dominic DiVincenzo
Date founded: 1978
No. of employees: 35; 50% devoted to on-line scvs.
Rev. last FY: $1.0M-$4.9M; 100% derived from computer svcs.
Primary customers: brokerage firms, private speculators, commercial/industrial customers
Sales concentration: all major market areas including Canada

Product line: provides video quotation services and software development services to brokerage firms, private speculators, financial institutions, agricultural concerns, and commercial firms. Market information is received and updated on a continuous basis via the company's private communications network.

Future plans: to provide on-line realtime stock, stock options, and OTC market quotes.

Commodity Information Services, Co. (CISCO)

327 S. LaSalle Street, Suite 800
Chicago, IL 60604
(312) 922-3661

Principal business:
- —on-line computer service company
- —database producer
- —off-line computer service company
- —software vendor

Applications emphasis: commodities; bonds

President: Donald Jones
Director of marketing: Roger Lofstrand
Date founded: 1967
No. of employees: 8; 90% devoted to on-line svcs.
Primary customers: banks, financial institutions, brokerage houses
Sales concentration: home office

Product line: produces databases containing information on prices for all the commodities traded in the United States and London and cash treasury bonds. On-line and off-line access is available through the Telenet communications network. The data is continuously. Provides access to an analytical program library, which is also available for in-house use.

Future plans: intends to expand in computer trade and research.

Communication Concepts Inc.

1044 Pulinski Drive
Ivyland, PA 18974
(215) 672-6900

Principal business:
- —on-line computer service company
- —remote, local and batch computer service company

Applications emphasis: accounting; banking and finance; government; insurance; sales and distribution; direct mail; facility design and management; advertising

President: Lew T. Teffeau
Director of marketing: Leo J. Hertzog, Jr., Exec. Vice President
Date founded: 1971
No. of employees: 250; 15% devoted to on-line svcs.
Rev. last FY: $10M-$19M; 30% from on-line svcs.
Primary customers: end users, insurance, banking, publishing
Sales concentration: Chicago, IL; Washington, DC; Philadelphia, PA; New York, NY; Dallas, TX; Los Angeles, CA

Product line: provides a service bureau operation on a job shop or contract basis. Services include time-sharing, remote job entry, data entry, direct mail services, contract programming, and high volume, lazer and impact printing. Also provides package or facilities management and direct mail production.

Future plans: intends to open sales offices in Miami, FL; Los Angeles, CA.; and Atlanta, GA.

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Company Profiles—A-C

COMNET Corporation, Computer Network Division

5185 MacArthur Boulevard, NW
Washington, DC 20016
(202) 537-2500

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
—facilities manager
Applications emphasis: data management and database management; education; engineering and scientific; government; mathematics and statistics; graphics

President: Gary M. Siegel
Director of marketing: Robert J. Gac
Date founded: 1967
No. of employees: 130; 90% devoted to on-line svcs.
Rev. last FY: $14M; 70% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides time-sharing and remote batch services via a nationwide telephone network. Systems include file editing capabilities, remote job entry capabilities, interactive processing, and text editing. Additional services include facilities management, consulting and professional services, graphics, and nonimpact laser printing. The company also sells proprietary software and is a distributor for IBM compatible terminals, PCs, and 3270 emulation boards.

Compu-Link Corp.

4000 N. Grand River
Lansing, MI 48906
(517) 323-4134

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM 370/135
—facilities manager
Applications emphasis: accounting; banking and finance; data communications; data management and database management; government; insurance; legal; manufacturing; medical and health care; payroll and personnel; sales and distribution

President: John LaRose
Date founded: 1969
No. of employees: 49
Primary customers: medical and health care facilities, mortgage loan companies
Sales concentration: home office

Product line: provides on-line and off-line computer services. The same applications are available for either online and batch processing. Packages are available for sale.

Compu-Mark U.S.

1333 F Street NW
Washington, DC 20004
(800) 421-7881

Subsidiary of: International Thomson Organization

Principal business:
—on-line service company
—database producer
—off-line computer service company
—trademark and related research and liaison services
Applications emphasis: education; legal; media; library related information

President: Ilene Gutman, Vice President of Operations
Director of marketing: Sharyn Hines
Date founded: 1983
No. of employees: 25
Rev. last FY: $1.0M-$4.9M
Primary customers: law firms, corporations, and marketing and merchandising professionals
Sales concentration: Washington, DC; New York, NY; Chicago, IL

Product line: provides investigative and liaison services regarding trademarks, patents, and copyrights. The company also investigates international trademarks.

Future plans: increase on-line clientele; develop enhancements to existing computer search programs; develop new services which can be offered as in-house services.

Compusearch Corporation

7631 Leesburg Pike
Falls Church, VA 22043
(703) 893-7200

Principal business:
—on-line computer services company
—database producer
Applications emphasis: government; government documents and publications; government services

President: James W. Benson
Director of marketing: Julie Kalms
Date founded: 1985
No. of employees: 11; 80% devoted to on-line svcs.
Primary customers: contract administrators, research librarians, defense contractors, and attorneys
Sales concentration: nationwide sales from home office

Product line: provides on-line access to all Federal Procurement Regulations Federal Acquisition Regulation (FAR) databases. Compusearch provides the full text of the FAR and all FAR supplements (approximately 26 databases), including Department of Defense, NASA, Navy, HHS, and GSA. The databases are updated daily; obsolete clauses are archived. The company gears its products to Fortune 1000 contract administrators and other federal contractors.

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Company Profiles—A-C

Future plans: plans to add proposed and pending changes to FAR, and will archive obsolete clauses. Also expects to add appeals board decisions and proposed legislation.

CompuServe, Inc.
5000 Arlington Centre Boulevard; P.O. Box 20212
Columbus, OH 43220
(614) 457-8600

Subsidiary of: H & R Block, Inc.

Principal business:
- —on-line computer service company
- —facilities manager

Applications emphasis: banking and finance; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; graphics; financial planning; electronic mail; mining and mineral exploration; general interest database categories; business related database categories

President: Charles W. McCall
Director of marketing: Terrance J. Aaron
Date founded: 1969
No. of employees: 725; 100% devoted to on-line svcs.
Rev. last FY: Over $50M; 100% from on-line svcs.
Primary customers: end users including major corporate customers, financial institutions, government agencies, and personal computer users
Sales concentration: nationwide

Product line: provides remote computing services, a value-added network service, and a videotex information service. CompuServe's remote computing service is its oldest and most significant business unit. Applications are available for banking management services, financial planning and analysis, database management and reporting, management sciences, research and development, demographic analysis, graphics, engineering, network and videotex communications services, and electronic mail. CompuServe also provides access to proprietary databases. The CompuServe Information Service provides videotex information to owners of personal computers. Subscribers access news from electronic newspapers and an international newswire. Other subscriber services include family information, national electronic bulletin boards, electronic mail, securities information, personal finance services, games and entertainment, and personal computing capabilities. CompuServe's Network Communication Service provides the value-added network service. Customers use CompuServe's network for communications and data transmission to and from their own host computer centers.

CompuSource
110 MacKenan Drive
Cary, NC 27511
(919) 469-3325

Principal business:
- —disaster recovery consulting
- —on-line computer services company
- —laser printing

Applications emphasis: consulting

President: Wayne Edge
Director of marketing: Don Smith
Date founded: 1980
No. of employees: less than 100
Rev. last FY: $5.0M-$10M
Primary customers: end users
Sales concentration: all sales out of home office

Product line: a disaster recovery and computing services firm catering to the needs of major organizations, data processing professionals, and end users. CompuSource is a multiproduct company offering disaster recovery, disaster recovery consulting, remote computing, and laser printing. Major emphasis is placed upon the disaster recovery and remote computing services.

Computer Accounting Inc.
P.O. Box 1154
Tacoma, WA 98401
(206) 272-7350

Principal business:
- —on-line computer service company

Applications emphasis: accounting; payroll and personnel

President: David Morris
Date founded: 1971
No. of employees: 10; 100% devoted to on-line svcs.
Rev. last FY: $200K-$499K; 100% from on-line svcs.
Primary customers: travel agencies, building contractors, small business
Sales concentration: home office

Product line: provides online, interactive, standard accounting and payroll packages. Each application has options for customization to individual client needs. Interfaces between applications is optionally available for validation and posting purposes. Reports requested by clients are printed either at the data center or in the clients' office. Users can access information via terminals. Formal training is provided.

Computer Associates Inc.
1814 South Main Street
South Bend, IN 46624
(219) 232-7921

Principal business:
- —on-line computer service company
- —software vendor, selling software for use with DEC PDP-11 and IBM-PC compatibles
- —value-added reseller of PC systems and software

Applications emphasis: general ledger; accounts payable; accounts receivable; retail industry information; pharmaceutical industry information

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Company Profiles—A-C

President: James A. Gross
Date founded: 1967
No. of employees: 8; 40% devoted to on-line svcs.
Rev. last FY: $500K-$999K; 30% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides on-line time-sharing services for accounting and pharmacy applications. The accounting system includes general applications; such as, accounts payable, accounts receivable, and general ledger. The pharmacy system includes prescriptions, label preparation, patient profiles, pharmacy inventories, accounts receivable, third-party billing, and year-to-date purchases per customer. Users include retail and retail specialty stores, pharmacies, manufacturers, and wholesalers.

Computer Center Inc.

423 West Monument Street
Baltimore, MD 21201
(301) 728-3883

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: data management and database management; inventory control; medical billing procedures

President: Jerome Markman
Date founded: 1956
No. of employees: 40; 25% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 100% from on-line svcs.
Primary customers: physicians, automobile dealers
Sales concentration: home office

Product line: provides time-sharing and batch processing services. Applications include professional billing for physicians, inventory control and comparative analysis for commercial companies, and specialized areas. Also offers customized programming.

The Computer Company

1905 Westmoreland Street
Richmond, VA 23230
(804) 358-2171

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
Applications emphasis: accounting; banking and finance; data management and database management; transportation; aviation; petroleum

President: Walter R. T. Witschey
Date founded: 1968
No. of employees: 1100; 5% devoted to on-line svcs.
Rev. last FY: $10M-$19M; 100% from on-line svcs.
Primary customers: airlines, banks, utilities, transportation companies
Sales concentration: Richmond, VA; Houston, TX; Los Angeles, CA; New York, NY

Product line: provides time-sharing services for over 600 on-line applications programs. The division specializes in applications packages for airlines, banks, and utilities. Also offers access to databases. The sources of information for these databases include: Civil Aeronautics Board, Avonark, Inc., and National Archives and Record Services for the C.A.B. database; Ernest E. Blanche Consultants for INS; Dencom, Inc. for DENCOM; American Petroleum Institute for API; Interstate Commerce Commission for ICC; and Federal Railroad Administration for FRA. Also provides an aircraft maintenance management system.

Future plans: intends to focus on Micro APL products, aircraft maintenance management, and banking data exchanges.

Computer Innovations

55 E. Jackson, Suite 1515
Chicago, IL 60604
(312) 663-5930

Principal business:
—on-line computer service company
—distributed processing
—dealer networks
—turnkey systems
Applications emphasis: accounting; banking and finance; data management and database management; engineering and scientific; legal; management sciences; mathematics and statistics; medical and health care; energy; text processing; food industry; retail industry information; pharmaceutical industry information; property management

President: Jean Franz
Date founded: 1969
No. of employees: 20; 20% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 20% from on-line svcs.
Primary customers: end users, consultants, trade associations
Sales concentration: midwestern states

Product line: provides contract programming and software development for individual use or for use bya network. Customizes many existing on-line packages and application programs to suit users specific needs. Offers hybrid on-line microcomputer systems. Also includes local dial-up from all major cities.

Future plans: more emphasis on food management and nutritional analysis, also retail profitability analyzer.

Computer Institute of America

465 Castro Street
Mountain View, CA 94041
(415) 964-0413

Principal business:
—on-line computer service company
Applications emphasis: accounting; legal; manufacturing; medical and health care; billing/invoicing/collection; accounts receivable; accounts payable; inventory control

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Company Profiles—A-C

President: Dr. Jerry Seehof
Date founded: 1970
No. of employees: 15; 12% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 95% from on-line svcs.
Primary customers: manufacturing companies, legal firms
Sales concentration: home office; San Francisco, CA

Product line: provides computer time-sharing services or turnkey multiterminal systems. Operational systems include legal and professional data collecting, billing, and receivables; accounts payable; accounts receivable; generalized data file maintenance and retrieval; financial analysis; payroll; distributor inventory; and a text editor. All programs run in both modes and are completely compatible.

Computer Resource Services, Inc.
770 East Sahara, Suite 301
Las Vegas, NV 89104
(702) 369-2800

Principal business:
—on-line computer service company
Applications emphasis: accounting; banking and finance; data management and database management; education; sales and distribution; accounts payable; accounts receivable; general ledger; cost accounting; inventory control; order processing; hotel/motel management

President: Ben Johnson
Director of marketing: Bill Mays
Date founded: 1980
No. of employees: 25; 100% devoted to on-line svcs.
Rev. last FY: $500K-$999K; 100% from on-line svcs.
Sales concentration: Las Vegas, Phoenix, Houston, Dallas, Miami, and Salt Lake City

Product line: provides general accounting and inventory management to complete business control. Includes payroll, accounts receivable, accounts payable, general ledger, time and cost accounting, inventory management, order entry invoicing, management reports, regression analysis, investment appraisal, wage, and tax statements.

Future plans: to open sales offices in major cities in the sunbelt area

Computer Sciences Corporation (CSC)
650 North Sepulveda Boulevard
El Segundo, CA 90245
(213) 615-0311

Principal business:
—on-line computer service company
—facilities manager
—consultants
Applications emphasis: accounting; data communications; data management and database management; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; sales and distribution; petroleum; graphics

President: William R. Hoover
Date founded: 1959
No. of employees: 13,000; 25% devoted to on-line svcs.
Rev. last FY: $50M or more; 25% from on-line svcs.
Primary customers: end users
Sales concentration: worldwide

Product line: provides computer services through its Information Network Services Group. Infonet, the international network service, is part of the group. Infonet network services include access to reference databases; financial, engineering, scientific, project management, simulation modeling, economic forecasting, mathematics, statistics, and graphics applications; and a variety of programming languages. The Information Network Services Group also provides on-line services to manufacturers and distributors for order entry, invoicing, inventory control, sales history, and analysis. The Industry Services Group provides a tax processing service for state and federal returns, facilities management, hospital turnkey systems, system development services, pharmacy claims processing and claims processing for Medicare in several states and for the Federal Emergency Management Agency's Flood Insurance Program. The divisions within the Systems Group offer system development, commercial engineering, consulting and turnkey systems principally to the U.S. Government.

Computer Sciences of Australia Pty. Ltd.
460 Pacific Highway
St. Leonards, NSW 2065 Australia
02-439-0033

Subsidiary of: Computer Sciences Corporation, El Sequndo, CA 90245

Principal business:
—on-line computer service company
—database producer
—software vendor, selling software for use with Univac, IBM, Prime
—consulting
—systems engineering
—specialized services for the mining and financial industries
Applications emphasis: accounting; banking and finance; data management and database management; engineering and scientific; government; insurance; management sciences; mathematics and statistics; sales and distribution; transportation

President: R. H. Kassel
Director of marketing: J. Pierce
Date founded: 1971
No. of employees: 600; 25% devoted to on-line svcs.
Rev. last FY: $20M-$50M; 50% from on-line svcs.
Primary customers: end users
Sales concentration: Australia

Product line: CSA is the largest supplier of computer services in Australia, with a staff of 500 computer professionals working in five main operating divisions. The Network Services Division offers a comprehensive and

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Company Profiles—A-C

versatile information processing service which combines a national and international telecommunications network with powerful central computer facilities in Sydney, providing time-sharing and remote-batch processing. The Systems Services Division undertakes large-scale support and development projects for government organizations, commerce and industry in the areas of consulting, systems management and project implementation. The Systems Engineering Division provides the knowledge, hardware and software experience necessary to design, engineer and install complex processor-based real-time systems. The Earth Sciences Division provides specialized computer services to the mining industry. Finally, the Axon Systems Division develops, and markets specialized computer systems to the finance industry.

Computer Sports World, Inc.
1005 Elm Street
Boulder City, NV 89005
(702) 294-0191

Subsidiary of: The Chronicle Publishing Company

Principal business:
—on-line services company
—database producer
Applications emphasis: sports

President: Dr. Robin Cobbey
Director of marketing: Brian Rouff
Date founded: 1983
No. of employees: 12; 100% devoted to on-line svcs.
Sales concentration: all sales out of home office

Product line: provides an elite database containing more than 3,000 files of sports and racing information, entitled Computer Sports World (CSW).

Computer Task Group Inc.
800 Delaware Avenue
Buffalo, NY 14209
(716) 882-8000

Principal business:
—on-line computer service company
—consultants
—off-line computer service company
—custom software development
—facilities manager
—computer system manufacturer
—conversions
Applications emphasis: banking and finance; manufacturing; telecommunications; metals; utility management; aerospace; automotive; chemicals

President: John P. Courtney
Date founded: 1966
No. of employees: 2,000+
Rev. last FY: $143M
Primary customers: end users
Sales concentration: international network—53 branch offices

Product line: designs, builds, implements, and maintains information and automation systems. The company also offers direct mail, conversion and documentation services, software development, remote computing, and batch processing services.

Computer-Time Corporation
P.O. Box 485, 17591 Highway 8
Morrison, CO 80465
(303) 697-4750

Principal business:
—on-line computer service company
—software vendor, selling software for use with DEC PDP-11 Series; Prime 50 Series
—facilities manager
Applications emphasis: accounting; education; insurance; legal; payroll and personnel; sales and distribution; transportation; marketing; real estate management

President: Jim Mayer
Date founded: 1970
No. of employees: 6; 100% devoted to on-line svcs.
Rev. last FY: $500K-$999K; 100% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides a general timesharing service. Applications include general ledger, accounts receivable, accounts payable, payroll, and inventory. Custom software is produced for customers on a charge basis. Dedicated multiplexed lines are provided for larger users. Client billing for professional services and tenant accounting for real property are specialty packages. Also available are file management and report generation software.

Computerized Conferencing & Communications Center
New Jersey Institute of Technology
Newark, NJ 07102
(201) 596-EIES

Subsidiary of: New Jersey Institute of Technology

Principal business:
—on-line computer service company
Applications emphasis: computer related information

President: Murray Turoff, Director
Director of marketing: Elaine B. Kerr
Date founded: 1974
No. of employees: 15
Primary customers: commercial end users and educational grant applicants

Product line: provides access to the Electronic Information Exchange System (EIES), a computerized conferencing system that operates at the New Jersey Institute of Technology (NJIT). The basic EIES system supports electronic messaging, conferencing, personal notebooks, text editing, network databases, and document preparation. It includes specialized features such as voting, automated questionnaires, and data-gathering to facilitate group communication processes. EIES has five alternative hu-

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Company Profiles—A-C

man machine interfaces, from simple menus for the beginning and casual user to self-defined user commands and procedures for customized tailoring of the interface. EIES also allows the development of specialized subsystems for specific tasks.

Future plans: development of a new generation of EIES is underway and will be available in the near future.

Computers for Marketing Corp. (CFMC)
547 Howard Street
San Francisco, CA 94105
(415) 777-0470

Principal business:
- on-line computer service company
- service bureau for processing of market/research studies
- software development and leasing at client-owned computer centers
- communications/network development for selected companies

Applications emphasis: consumer and market research; advertising; marketing

President: Leif Gjestland
Date founded: 1967
No. of employees: 30
Primary customers: market research suppliers, advertising agencies, corporate market research departments, survey research agencies
Sales concentration: U.S. (nationwide), Canada, Mexico, Europe

Product line: provides complete line of integrated market/survey research software: key-to-disk device (MICROPUNCH) which replaces keypunch; CRT interviewing for telephone facilities (SURVENT) or intercept situations (MICROSURVENT); cross tabulation and data analysis software for beginner (SURVEYOR, TUTOR) through expert (MENTOR); and statistical analysis software for regression, correlation, ANOVA, chi square, etc. on multipunched data files (STATPAK). Programs are available on a lease basis for customer-owned computer facilities or on a time-share basis through the San Francisco or Denver computer centers. On-site training, hotline support, and consulting are provided. Catering to the more sophisticated research client, the software is continually enhanced and updated. Complete service bureau production work is also available on a project basis at either computer center. Both facilities offer staff expertise in defining and maintaining large or complex databases, in using SURVENT to set up CRT-telephone interviews, in transferring data to and from microcomputers, and in running customer-defined crosstabs or management reports (using MENTOR) from survey questionnaires.

Comshare, Incorporated
3001 South State Street, P.O. Box 1588
Ann Arbor, MI 48106
(313) 994-4800; (800) 922-7979

Principal business:
- on-line computer service company
- software vendor, selling software for use with mainframes and microcomputers in an IBM environment
- consultants

Applications emphasis: budget systems; forecasting; business and strategic planning; statistical analysis; graphics; computer related information

President: Richard L. Crandall
Director of marketing: Kevin O.N. Kalkhoven
Date founded: 1966
No. of employees: 989
Rev. last FY: $50M or more
Primary customers: Fortune 1000 companies and major banks, telephone companies
Sales concentration: nationwide, Europe, Canada

Product line: provides products and services marketed under the term decision support to provide solutions for an organization's business problems. Comshare's mainframe software package is System W for IBM equipment, and is used by individuals in corporations who do financial and business planning, forecasting, and analysis. Primary minicomputer software packages are Profiles/3000, a personnel management system for the Hewlett-Packard 3000 minicomputer; and Retrivue, a directory assistance information retrieval system for Data General minicomputers within telephone companies and major corporations. Microcomputer software packages include Profiles/PC, a personnel recordkeeping and reporting software system; Applicant Tracking, to support job applicant informtion; and Job Evaluation, for evaluation, maintenance, and reporting of pointed or graded jobs. This software runs on the IBM PC XT, IBM PC AT, and Compaq personal computers. Comshare also offers training software for IBM's VM/CMS operating environment called "Introduction to VM/CMS for Information Center End Users." This course runs on the IBM PC, IBM PC XT, and the IBM 3270 PC. Timesharing-based products include System W for business planning, Questor for information management, Tactics for data analysis, Orion for time-series analysis, Profiles Services for human resource management applications, and telecommunications software and service for telephone companies.

Comtech Group International Limited
5 Fairview Mall Drive, Suite 450
Willowdale M2J 2Z1, Canada
(416) 492-1480

Principal business:
- on-line computer service company
- off-line computer service company

Applications emphasis: accounting; payroll and personnel; sales and distribution

President: Donald Gray
Director of marketing: Rod Dobson
Date founded: 1966
No. of employees: 120; 40% devoted to on-line svcs.

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Company Profiles—A-C

Rev. last FY: $5.0M-$9.9M; 100% from on-line svcs.
Primary customers: end users
Sales concentration: Toronto, Canada; Montreal, Canada; Vancouver, Canada; Winnipeg, Canada; Edmonton, Canada; Waterloo, Canada

Product line: provides batch and timesharing services for packaged application products. Timesharing applications include sales order processing, inventory reporting, accounts receivable, invoicing, sales analysis, financial planning, and word processing. Batch applications include payroll, general ledger, and accounts payable. All batch services can be set up with a timesharing front end for data entry.

Future plans: intends to provide purchasing and personnel applications via timesharing.

Concap Computing Systems
680 Hegenberger Road, Suite B2
Oakland, CA 94621-1921
(415) 635-5750

Principal business:
—on-line computer service company
—consultants
Applications emphasis: accounting; engineering and scientific

President: Stewart Larson
Date founded: 1965
No. of employees: 10; 30% devoted to on-line svcs.
Primary customers: civil engineering companies, land surveying companies, city and county public works departments
Sales concentration: home office

Product line: provides timesharing services for civil engineers, land surveyors, and structural engineers. Applications include: coordinate geometry, field survey stakeout and reductions, earthwork quantities, and frame and truss analysis. The coordinate geometry programs interface with graphics programs producing subdivision plots and grading plans. The programs are also available on in-house turnkey minicomputer systems, using IBM PC/AT/XT. Also produces customized programs.

Concord Computing Corp.
500 W. Cummings Park, Suite 3500
Woburn, MA 01801
(617) 933-8910

Principal business:
—on-line computer service company
—electronic transactions
—electronic authorization systems using Tandem computers
—financial switch and settlement systems
—facilities manager
—application specific data entry terminals
Applications emphasis: banking and finance; retail trade data; electronic funds transfer

President: thomas Swithenbank
Director of marketing: James Crane, Vice President, Sales
Date founded: 1969
Primary customers: commercial banks, supermarket chains
Sales concentration: home office; Chicago, IL; Overland Park, KS

Product line: provides on-line services for check authorization at the retail level and financial applications for banking institutions. Clients can access their bank's computer or the Concord Computing data center. Also provides point-of-sale terminals, self-service banking terminals, and cash dispersement equipment.

Connections Telecommunications, Inc.
322 East Center Street
West Bridgewater, MA 02379
(617) 584-8885

Principal business:
—on-line service company
—software vendor
Applications emphasis: telecommunications; data communications

President: Gerald P. Ryan
Director of marketing: John C. Hotchkiss
Date founded: 1980
No. of employees: 24
Rev. last FY: $1.0M-$4.9M
Primary customers: end users, data communications equipment vendors
Sales concentration: worldwide

Product line: producers of the Online Telecommunications Information Service (O.T.I.S.). The service is an on-line reference and pricing resource for telecommunications tariff environments.

Future plans: several new products are slated for release, including a packet-switched network design package and a queueing analysis package for use on PCs.

Construction Computer Control Corp.
615 E. Michigan Street
Milwaukee, WI 53202
(414) 278-0500; (800) 558-9018

Principal business:
—on-line computer service company
Applications emphasis: accounting; payroll and personnel; job cost accounting; construction

President: William C. Koenig
Date founded: 1968
No. of employees: 60; 100% devoted to on-line svcs.
Primary customers: construction companies
Sales concentration: nationwide

Product line: provides timesharing and distributed processing (microcomputer/mainframe linking) services to construction contractors. Services include integrated payroll/labor cost control, accounts payable/receivable,

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Company Profiles—A-C

cash flow analysis, job cost analysis, subcontractor control, purchase order/committed cost control, historical job cost productivity analysis, capital equipment control, inventory control, and general ledger/financial statements. Other stand-alone application services include bid market strategy analysis, bid solicitation, shop drawing control, critical path scheduling, asphalt plant cost control and property management. Downloading of data from the mainframe to the microcomputer provides additional capabilities to perform long-range cash forecasting, manpower planning, and analytical functions using spreadsheet software. All application services are marketed under the name *System 5*. Free communications capabilities are provided to most System 5 users.

The Continuum Company (TCC)

3429 Executive Center Drive
Austin, TX 78731
(512) 345-5700

Principal business:
—on-line computer service company
—off-line computer service company
—computer system manufacturer
—maintenance company
—consultants
Applications emphasis: insurance; financial services

President: Ronald C. Carroll
Director of marketing: Brian Mulconrey
Date founded: 1968
No. of employees: 750
Primary customers: insurance companies
Sales concentration: international; Dallas, TX; Austin, TX; Toronto, Canada; London, England

Product line: provides full-function client management, contract administration and marketing software for life insurance companies. System include new business processing, policy issue, billing and collection agency production and persistency, policy exhibit and valuation, and policyowner service. Remote processing services are also available. Marketing systems include sales proposals and illustrations, client information, and letter writing for micro computers. The company also provides actuarial and management consulting, implementation, and installation services.

Control Data Corporation

8100 34th Avenue South, Box 0
Minneapolis, MN 55440
(612) 853-8100

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with Control Data computers and those of other manufacturers
—computer system manufacturer
—maintenance company
—consultants
—financial services company
Applications emphasis: accounting; banking and finance; data communications; data management and database management; education; engineering and scientific; government; legal; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution; econometric forecasting

President: Robert M. Price, CEO
Director of marketing: Robert W. Duncan, Sr. V.P. Corporate
Date founded: 1957
No. of employees: 44,000
Rev. last FY: $50M or more
Primary customers: end users and other manufacturers in business, industry, and government
Sales concentration: world-wide

Product line: provides interactive and batch processing services. Offers applications programming primarily in the scientific and engineering areas. Provides data and services through the Business Information Services, a Control Data company, and communications services through Cybernet, Network Information Services. Offers maintenance through their engineering services division and professional services include consulting and application development.

Control Data Corp., Business Information Services

500 W. Putnam Avenue
Greenwich, CT 06830
(203) 622-2000

Principal business:
—on-line computer service company
Applications emphasis: banking and finance; data management and database management; sales and distribution

President: C. J. Brown, Sr. V.P. of Network Information Services
No. of employees: 65,000
Primary customers: end users, typically in the marketing and finance function
Sales concentration: 30 branch offices nationwide

Product line: provides a wide range of information services. This would include many databases and the software and network to integrate, analyze and report on both internal and external data. In addition user support and consulting to assist customers to define and implement applications that address business issues confronting executives in target industries are provided.

Cooper Data Systems, Inc.

636 Baronne Street
New Orleans, LA 70113
(504) 581-7611

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM System 36
—computer vendor selling IBM System 36 and PCs

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Company Profiles—A-C

Applications emphasis: accounting; legal; construction; oil and gas exploration

President: William G. Barry
Date founded: 1945
No. of employees: 25
Rev. last FY: $1.0M-$4.9M
Primary customers: end users
Sales concentration: South Louisiana

Product line: provides timesharing and services for law firm accounting. Applications available through batch processing include accounts receivable, accounts payable, payroll, general ledger, insurance, and time accounting.

Cornell Computer Services
G02 Uris Hall, Cornell University
Ithaca, NY 14853
(607) 256-4981

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: education
Director of marketing: Greg Appling
Date founded: 1967
No. of employees: 165; 50% devoted to on-line svcs.
Primary customers: Cornell University, academic institutions
Sales concentration: home office

Product line: provides batch and interactive computer services for instruction or research applications. Offers statistical programming and econometric analysis through the Troll System and identification of chemical substances through Mass Spectral Analysis. Also licenses software enhancements to the VM operating system.

Corporate Services, Inc.
3410 E. McDowell Road
Mesa, AZ 85203
(602) 832-8230

Principal business:
—on-line computer service company
—software vendor, selling software for use with IBM 4300
—maintenance company
—consultants
Applications emphasis: accounting; data communications; insurance; mathematics and statistics; payroll and personnel

President: Don R. Horrocks
Director of marketing: Don R. Horrocks
Date founded: 1972
No. of employees: 6; 50% devoted to on-line svcs.
Rev. last FY: $200K-$499K; 90% from on-line svcs.
Primary customers: insurance companies, accountants
Sales concentration: home office

Product line: provides international timesharing services for general business applications, sales aids, qualified pension, actuarial, and profit-sharing plans, using the APL programming language. Programming can be done by the user. Also provides custom programming for specific applications, tele-mail, and word processing.

CRC Information Systems, Inc.
435 Hudson Street
New York, NY 10014
(212) 620-5678

Principal business:
—on-line computer service company
Applications emphasis: consumer and market research

President: Jeffery A. Starr
Date founded: 1975
No. of employees: 75; 100% devoted to on-line svcs.
Primary customers: Fortune 500 companies, market research companies, advertising agencies
Sales concentration: home office; Chicago, IL; Westport, CT

Product line: provides on-line timesharing. Applications are available for market research data processing and multi-variate statistical work.

Creative Socio-Medics, Inc.
16 East 32nd Street
New York, NY 10016
(212) 696-3500

Subsidiary of: Advanced Computer Techniques Corporation

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—turnkey systems
Applications emphasis: accounting; medical and health care; mental health information; pharmaceutical industry information; humanities

President: Jerry Koop
Director of marketing: Richard Hourahan
Date founded: 1968
No. of employees: 90
Rev. last FY: $1.0M-$4.9M
Primary customers: end users in medical/health care marketplace
Sales concentration: home office; Washington, DC; Phoenix, AZ

Product line: provides time-sharing services, batch information processing, and integrated minicomputer systems. Provides health care management information systems and services for a variety of health care settings including: outpatient clinics, mental health and psychiatric facilities, corporate medical departments, and hospital based ambulatory care facilities. Also provides consulting and technical assistance services.

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Company Profiles—A-C

Cross Information Company
934 Pearl Street, Suite B
Boulder, CO 80302

Principal business:
—on-line computer service company
—software vendor
—tele/conferencing systems; strategic planning
Applications emphasis: electronic mail; publishing industry services

President: Alan W. Harris
Director of marketing: Ronald Kauffman
Date founded: 1980
No. of employees: 10
Primary customers: small business and organizations; Fortune 500
Sales concentration: Denver, CO and Washington, DC

Product line: provides tele/conferencing and electronic mail publishing services and software via Telenet, WATS, and direct mail, and custom programming for databases, information systems, and tele/conferencing. Also provides tele/conferencing system planning for video and audio systems and computers.

Crowntek, Inc.
3000 Steeles Avenue East
Markham, Ontario L3R 4T9 Canada
(416) 493-0800

Principal business:
—on-line computer service company
—software vendor
—consultants
—facilities management
—enhanced communications services
Applications emphasis: data processing; accounting; payroll and personnel

President: Edward P. Cannon, Vice-President
Date founded: 1983
No. of employees: 1,500
Primary customers: commercial business, government, financial, and public organizations
Sales concentration: Canada and U.S.

Product line: the company's main products include Shared Processing, a remote interactive and batch processing service that is an alternative to in-house computing; Dedicated Processing, a data center management service; Prod/Net, an office automation service; and Streamline, an enhanced communications service. The company also offers microcomputer hardware and software; mainframe database management systems; applications development services; end user software; and education, consulting, and computer output to microfiche services.

CTS Services, Inc.
2720 Stemmons Freeway, Suite 805
Dallas, TX 75207
(214) 637-3344

Principal business:
—on-line computer service company
—software vendor
Applications emphasis: accounting; banking and finance; data management and database management; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution; transportation; energy

President: Carlton E. Wade
Director of marketing: D. Michael Cannady
Date founded: 1980
No. of employees: 15; 100% devoted to on-line svcs.
Rev. last FY: \$500K-\$999K; 100% from on-line svcs.
Primary customers: end users
Sales concentration: home office

Product line: provides on-line services out of two divisions: "500" Division and Small Business Division. The "500" Division provides management time-sharing and specialized software development on large scale computers operating under the Dartmouth Timesharing System (DTSS). Local telephone access is available from most U.S. cities and some international points. Small Business Division provides time-sharing on minicomputers operating under the Pick Operating System. Access is via local telephone into the customers private port on a machine. Provides access to CTS' Resolve Accounting System software for a fixed monthly charge for unlimited machine access. Also features oil and gas accounting software. The primary service emphasis is the Southwest.

Future plans: intends to produce growth in both divisions by the introduction of new specialized software application products and greater market penetration in existing and new marketplaces.

Cucumber Information Systems
5611 Kraft Drive
Rockville, MD 20852
(301) 984-3539

Subsidiary of: Cucumber Bookshop, Inc.

Principal business:
—on-line computer services company
—software vendor
Applications emphasis: data management and database management; library related information

President: David J. Harris
Director of marketing: Ken Harris
Date founded: 1981
No. of employees: 5; 40% devoted to on-line svcs.
Rev. last FY: under \$200,000; 100% derived from computer svcs.
Primary customers: research libraries
Sales concentration: all sales out of home office

Product line: distributors of the SIRES Information Retrieval System. The SIRES system helps users find information simply, accurately, and at a low cost. It is designed for individuals, offices, or libraries with a need to store and retrieve records containing text. The company is also the developer of SHAR-IX, a generalized database management system designed for text-oriented materials, i.e. library systems, in-house databases, information management systems, or any application that mixes a quantity of text with numeric or other data types.

Future plans: development of a true Integrated Library System running on top of SHAR-IX that will handle all traditional library functions and also handle the full text of abstracts, research reports, or other information files in in-house databases.

Cumulus Systems Limited

1 High Street
Rickmanworth, Herts WD3 1ET
(0923) 720477

Principal business:
- —database producer
- —software vendor

Applications emphasis: stock information; bonds

President: G.T. Rhodes
Director of marketing: Sue Dobson
Date founded: 1977
No. of employees: 40
Primary customers: end users
Sales concentration: international

Product line: provides software for the financial marketplace. The *TAC-G Gilts Information Service* is available on-line and provides facilities to aid profitable mangement and dealing in U.K. government securities. Also availabe through the company is a the EXBOND database service. The datbase gives details of approximately 8,000 euro and foreign bonds

Cuna Data/Norfolk

888 Norfolk Square
Norfolk, VA 23502
(804) 857-0681

Principal business:
- —on-line computer service company
- —off-line computer service company

Applications emphasis: accounting; credit union accounting

President: David Jackson, Account Manager
Date founded: 1964
No. of employees: 48; 80% devoted to on-line svcs.
Rev. last FY: $200K-$499K; 85% from on-line svcs.
Primary customers: credit unions, banks
Sales concentration: home office

Product line: provides interactive and batch processing services for all types of account processing for credit unions. Available credit union applications include shared accounts, shared/draft accounts, loans, Certificates of Deposit, and stock ledger. Currently serving the Mid-Atlantic states (Maryland, Virginia, North Carolina, South Carolina, Georgia, and Washington, DC).

Custom Computer Services, Inc.

2210 San Joaquin
Fresno, CA 93721
(209) 486-4750

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor, selling software for use with DEC products; BTI 5000/8000
- —facilities manager
- —computer system manufacturer
- —maintenance company

Applications emphasis: accounting; agriculture

President: John Dodson
Date founded: 1970
No. of employees: 50; 50% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 90% from on-line svcs.
Primary customers: cross-industry
Sales concentration: home office; Bakersfield, CA; Visalia, CA; Merced, CA

Product line: offers timesharing and batch processing services for general business and agricultural application. The timesharing service is available with the ability to migrate to a complete in-house system using identical software. Also provides custom programming.

Cybershare, Ltd.

550 Berry Street
Winnipeg, Manintoba, Canada R3H OR9

Principal business:
- —on-line computer srvices company
- —off-line computer services company
- —software vendor
- —facilities manager

Applications emphasis: accounting; education; engineering and scientific; government; legal; management sciences; manufacturing; mathematics and statistics; payroll and personnel; sales and distribution

President: Jack Turner
Director of marketing: Jack Turner
No. of employees: 102; 100% devoted to on-line svcs.
Rev. last FY: $1.0M-$4.9M; 100% from on-line svcs.

Product line: a service utility offering time-sharing services in the fields of education, and science and engineering. Other services include financial planning, and on-line management information systems such as A/R and inventory control. The company's software will run on Control Data's Cyber 170/174 and Honeywell's 66/440.

Cybertek Computer Products, Inc.

6133 Bristol Parkway
Culver City, CA 90230
(213) 649-2450

Principal business:
- —on-line computer service company
- —database producer
- —off-line computer service company

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Company Profiles—A-C

—facilities manager
—office automation systems
Applications emphasis: insurance

President: Vaughn W. Morgan
Date founded: 1969
No. of employees: 250; 25% devoted to on-line svcs.
Primary customers: life insurance companies
Sales concentration: nationwide

Product line: provides on-line and batch processing services for life insurance applications. Five on-line applications and nine batch applications are provided on a service arrangement. Other software packages offered include management reporting, cash dispersement, and agency/client information systems. A letter writing system is available that accesses the Cybertek service bureau. The service bureau offers time-sharing services with standard operating systems, on-line programs, and HASP/RJE batch processing.

Future plans: intends to expand their life insurance network.

Cycare System, Inc.
4343 E. Camelback Road
Phoenix, AZ 85018
(602) 952-5300

Principal business:
—on-line health care computer service company
Applications emphasis: patient treatment; patient accounting; financial services; medical and health care

President: James D. Dyer
Director of marketing: Curt Barker, V.P.
Date founded: 1968
No. of employees: 1,000; 88% devoted to on-line svcs.
Rev. last FY: $50M or more
Primary customers: hospitals, physicians, medical groups, Health Maintenance Organizations, distribution services
Sales concentration: United States and Canada

Product line: provides time-sharing, software system and service, and remote processing services. Applications available in the medical area.

Future plans: Expansion of clinic products to more medically-oriented applications. Expansion of existing HMO modules and of on-line capability of financials.

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Company Profiles—J-R

Ja Net Global Securities
931 Austin Avenue
Salt Lake City UT 84106
(801) 485-9585

Principal business:
—on-line service company
—database producer
Applications emphasis: banking and finance; data communications; data management and database management; government; legal; manufacturing; media; sales and distribution

President: Maureen Janney
Date founded: 1985
No. of employees: 10; 75 percent devoted to on-line services
Rev. last FY: $500K-$999K; 95 percent derived from computer services
Primary customers: end users, corporations
Sales concentration: worldwide

Product line: producers of the International Entrepreneur database. The database provides companies, individuals, and governments with classified ads for items for sale or trade.

Jacobsen and Associates, Inc.
10229 Lower Azusa Road
Temple City, CA 91780
(818) 575-7504

Principal business:
—on-line computer service company
Applications emphasis: accounting; banking and finance; management sciences; manufacturing; payroll and personnel

President: Kenneth R. Jacobsen
Director of marketing: Gerald I. Parker
Date founded: 1969
No. of employees: 30; 50 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 85 percent from on-line services
Primary customers: industrial manufacturers
Sales concentration: home office

Product line: provides a management information service for industrial manufacturing control, accounting, and finance. The information is available from a service bureau through on-line real time. Also available are software lease/purchase services and turnkey installations.

Jefferson Pilot Data Services, Inc. (JDS)
501 Archdale Drive
Charlotte, NC 28217
(704) 529-3901

Principal business:
—information processing/data communications
Applications emphasis: media; broadcasting

President: Mike Jones
Director of marketing: Doug Rother
Date founded: 1969
No. of employees: 300; 60 percent devoted to on-line services
Rev. last FY: $20M-$50M; 60 percent from on-line services
Primary customers: broadcast stations, advertising agencies, cable systems
Sales concentration: Charlotte, NC; Memphis, TN

Product line: the company's *BIAS* (*Broadcast Industry Automation System*) provides on-line computer services for broadcast stations for sales, accounting, traffic, and engineering. The JDS New York office offers on-line services for stations, national sales reps, and advertising agencies. Its primary products lines are *REPLINE* and *SESAMI* systems for national sales rep, station sales, and research applications. The *JDS Medialine* system is an on-line service for advertising agencies and media buying services.

Future plans: to provide a broadcast industry-wide database to speed up advertising buys, scheduling, and final payment for stations, national reps, and agencies. Plans also call for including radio and cable TV applications, and widening the scope of the broadcast industry database to other industry applications and subscribers.

Kaman Sciences Corp.
1500 Garden of the Gods Road, P.O. Box 7463
Colorado Springs, CO 80933
(303) 599-1450

Subsidiary of: Kaman Corp.

Vendor did not respond to update requests.

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM System 38
Applications emphasis: accounting; media

President: Albert Bridges
Director of marketing: George T. Beattie
Date founded: 1968
No. of employees: 700; 10 percent devoted to on-line services
Primary customers: broadcast stations
Sales concentration: home office

Product line: provides in-house on-line processing services. Computer services are available for business, sales, traffic, news, and films automation interface. Also produces broadcasting systems that include software for electronic switching interface, and word processing. The systems are available as turnkey systems or on a monthly lease arrangement.

Kennedy and Coe Data Processing Services
P.O. Box 1100, United Building
Salina, KS 67401
(913) 825-1561

Subsidiary of: Kennedy and Coe, C.P.A.'s

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Company Profiles—J-R

Principal business:
—on-line computer service company
—off-line computer service company
—consultants
Applications emphasis: accounting; education; engineering and scientific; legal; medical and health care; sales and distribution; agriculture
Director of marketing: John Page
Date founded: 1960
No. of employees: 25; 70 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 70 percent from on-line services
Primary customers: accounting, agriculture, engineering, legal, nursing homes, motels, restaurants, manufacturing, retail & wholesale industries
Sales concentration: Kansas; Nebraska; Oklahoma; Colorado

Product line: provides on-line dial-up, batch processing, remote processing and data entry services. Applications include: accounts receivable; general ledger; payroll; billing and invoicing; sales analysis and forecasting; project costing; labor distribution and time reporting; property management and fixed asset accounting; attorney management; income tax return processing; accounts payable, and mail list and label processing. Clients access the data center in Salina via in-office terminals. Other services include custom software development and management consulting. The company also sells or leases the applications.

Keydata Corp.
85 E. Belcher Road
Foxboro, MA 02035
(617) 543-7921

Principal business:
—on-line computer service company
Applications emphasis: order processing; billing/invoicing/collection; inventory control; accounts receivable; sales analysis

President: Robert Bienkowski
Director of marketing: Harry Valencia
Date founded: 1959
No. of employees: 50
Primary customers: end users
Sales concentration: Northern Montreal, Toronto, and the U.S.

Product line: provides interactive processing services. Offers a range of distribution-oriented applications to distributors and manufacturers. The services are designed for companies with annual sales of $2 million to giant industrial corporations. Applications include: order processing, invoicing, inventory control, accounts receivable, accounts payable, report writing, word processing, purchase order, general ledger, financial reporting, and sales analysis. Availability is through two types of services: a Distribution Accounting On-line Service for companies with sophisticated requirements.

Future plans: intends to enhance the present service in terms of both additional applications to meet the needs of existing customers, as well as expansion into new application areas.

Landart Systems, Inc.
65 Boradway, 11th Floor
New York, NY 10006
(212) 363-3170

Principal business:
—on-line computer service company
—off-line computer service company
—consultants
Applications emphasis: banking and finance; engineering and scientific; insurance; mathematics and statistics; graphics; financial modeling

President: John Gilmour
Date founded: 1973
Primary customers: cross-industry
Sales concentration: home office

Product line: offers time-sharing services on a national basis and to major cities worldwide through networks. Available applications include electronic publishing, laser printing, and computer graphics. Also provides computer output using a Xerox 9700. Designs customized applications to fit user needs.

Legislative Information System
705 Stratton Office Building
Springfield, IL 62706
(217) 782-3944

Subsidiary of: State of Illinois—Illinois General Assembly

Principal business:
—on-line computer service company
Applications emphasis: government; legislative bill information

President: John T. Hatcher, Director
Date founded: 1977
No. of employees: 30; 10 percent devoted to on-line services
Primary customers: business entities, lobbyists, special interest groups
Sales concentration: home office

Product line: provides access to the *Bill Status System* database for an annual subscription fee and makes available printed reports to other users upon payment of an annual fee. Information available through dial-up terminals includes: condensed Bill Status inquiry, complete Bill Status inquiry, topic inquiry, sponsor inquiry, committee inquiry, user inquiry, bills last acted on for a certain date, and committee hearings and commission meetings. Also provides technical assistance and training.

Future plans: intends to continue modifying and adding a variety of inquiries for users to track and research legislation.

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Company Profiles—J-R

Litton Computer Services

1831 Michael Faraday Drive
Reston, VA 22090
(703) 471-9200

Subsidiary of: Litton Systems, Inc.

Principal business:
—on-line computer service company
—off-line computer service company
—nonshared (dedicated) computing

Applications emphasis: accounting; data communications; data management and database management; education; engineering and scientific; government; insurance; legal; management sciences; manufacturing; payroll and personnel; word processing; tax calculation/budgeting/processing; publishing industry services; graphics

President: L. G. Fondiler, Vice President and General Manager, Woodland Hills Data Center
Director of marketing: John L. Cudworth, V.P. of Business Development
Date founded: 1968
No. of employees: 500; 100 percent devoted to on-line services
Primary customers: end users
Sales concentration: Los Angeles, CA; San Diego, CA; San Francisco, CA; Reston, VA; Washington, DC; New York, NY; Chicago, IL

Product line: provides time-sharing, batch processing, and remote job entry services. Offers computer graphic services, personal computer/mainframe communications, business printing services, modeling and analysis software, word processing, and database management. Available language compilers include Cobol, Fortran, PL/1, Assembler, APL, RPG, Basic, and Pascal. Also provides automated typesetting and photo composition, plotting, and microfiche. Offers a dedicated machine environment nationwide network through Litton data network.

Future plans: LCS plans to actively expand all computer support and services.

Lockheed Data Plan, Inc.

90 Albright Way
Los Gatos, CA 95030
(408) 866-7611

Subsidiary of: Lockheed Corp.

Principal business:
—on-line computer services company
—transportation information services

Applications emphasis: transportation; aviation; weather; graphics

President: Al Curtis
Date founded: 1982
No. of employees: 95; 85 percent devoted to on-line services
Rev. last FY: $10M-$19M
Primary customers: USAF; RAF; Canadian Armed Forces; airlines; corporations

Product line: supplies computerized flight plans on its advanced, optimized route system called JetPlan. Lockheed DataPlan, Inc. provides computerized weather information and graphics via MetPlan. The company serves the USAF with a military version of JetPlan called MacPlan, which resides on the Air Force's Global Weather Central computers. Another service, OpsPlan, is an aviation information management system that organizes the aviation manager's MIS, scheduling, maintenance, and inventory functions. Lockheed DataPlan, Inc. also provides international flight services such as reservations, information, and permits for the international flight community.

Future plans: new services include JetPlan II, an expansion of JetPlan services; personalized weather briefings; and special services to airline customers, including access by the high speed SITA lines.

Lynch Data Processing

740-A Industrial Drive
Cary, IL 60013
(312) 639-2351

Principal business:
—on-line computer service company
—off-line computer service company

Applications emphasis: accounting; accounts receivable; order processing

President: Roberta W. Lynch
Director of marketing: John G. Lynch
Date founded: 1964
No. of employees: 14; 36 percent devoted to on-line services
Rev. last FY: $200K-$499K; 100 percent from on-line services
Primary customers: manufacturers, distributors, financial institutions
Sales concentration: home office

Product line: provides interactive and batch processing services. The applications available via interactive processing include accounts receivable and order entry invoicing. General accounting applications are available through the batch services. Also offers a telephone bill paying plan.

MTech Ohio Valley

2515 Washington Boulevard
Belpre, OH 45714
(614) 423-9501

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
—facilities manager
—maintenance company
—consultants

Applications emphasis: accounting; banking and finance; data communications; education; engineering and scientific; payroll and personnel; sales and distribution

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President: R. W. Bom
Director of marketing: Stanley Cox
Date founded: 1964
No. of employees: 130; 25 percent devoted to on-line services
Rev. last FY: $5.0M-$9.9M
Primary customers: financial institutions
Sales concentration: home office

Product line: provides on-line and off-line processing services. Area of specialization is banking applications. Also offers small business system applications. Currently serving Southeast Ohio and West Virginia.

Madison Academic Computing Center (MACC)—University of Wisconsin
1210 West Dayton Street
Madison, WI 53706
(608) 262-2054

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: data management and database management; engineering and scientific; mathematics and statistics; graphics; electronic mail; education
Director of marketing: Ann P. Schutt
Date founded: 1966
No. of employees: 70; 100 percent devoted to on-line services
Rev. last FY: $5.0M-$6M; 50 percent from on-line services
Primary customers: researchers, professors, students, social scientists, natural scientists, engineers, academic personnel
Sales concentration: home office

Product line: provides time-sharing and networking services. Applications include statistical, mathematical, bibliographic, modeling, operations research, information handling, electronic mail, and type composition. The organization has tape conversion capabilities, laser printing, and plotter and color graphics capabilities. In addition, MACC also offers contract programming, user consulting, and training. Access is primarily targeted to educational, non-profit, and governmental institutions. A limited number of commercial applications are allowed.

Future plans: site licensing of VAX software and microcomputer software.

Management Analysis by Computer, Inc.
P.O. Box 3090
Guttenberg, NJ 07093
(201) 869-2418

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: accounting; banking and finance; data management and database management; engineering and scientific; management sciences; mathematics and statistics; payroll and personnel; sales and distribution; graphics; inventory control; word processing; electronic mail

President: Dr. Virgil C. Harrington
Director of marketing: Dr. Virgil C. Harrington
Date founded: 1977
No. of employees: 2; 100 percent devoted to on-line services
Primary customers: newspapers, consulting firms, CPA firms
Sales concentration: home office

Product line: provides remote computer time-sharing for a variety of applications including accounting, statistics, database management, report generation, word processing, cash flow analysis, order entry, inventory control survey analysis, engineering, electronic mail, spreadsheets and graphics. The business applications includes profitable analysis, return on investment, modeling for product line pricing, and budget and financial planning.

Management Computer Services, Inc.
2790 Fisher Road
Columbus, OH 43204
(614) 272-0202

Vendor did not respond to update requests.

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with Digita Equipment Corp. PDP-11
—computer system manufacturer
—maintenance company
Applications emphasis: accounting; insurance; legal; payroll and personnel; sales and distribution; inventory control; country club accounting procedures; membership management systems; automotive

President: Donald A. Turner
Date founded: 1964
No. of employees: 55; 80 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 80 percent from on-line services
Sales concentration: home office; Cincinnati, OH

Product line: provides time-sharing services through the company's Dallas, TX data center. Services include applications for country club accounting, association membership, car dealership accounting, and inventory control. Performs consulting on applications and computer hardware. Also training and maintenance services for the software and hardware products.

Management Concepts, Inc.
1640 Powers Ferry Road, Building 20
Marietta, GA 30067
(404) 955-4024

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for micros and minis

Company Profiles—J-R

—facilities manager
—PC micro sales/systems

Applications emphasis: accounting; data management and database management

President: E. J. Solomon
Date founded: 1970
No. of employees: 10; 90 percent devoted to on-line services
Primary customers: cross-industry
Sales concentration: home office

Product line: provides time-sharing and batch processing for accounting applications. The software packages are also available for sale. Application software is available for association, construction, and real estate markets on micro and minis.

Management Science Associates, Inc.
6565 Penn Avenue at Fifth
Pittsburgh, PA 15206-4490
(412) 362-2000

Principal business:
—on-line computer service company
—off-line computer service company
—consulting
—analytical services

Applications emphasis: data management and database management; management sciences; mathematics and statistics; sales and distribution; marketing program services; advertising

President: Alfred A. Kuehn
Director of marketing: Patrick L. Flannery, Executive Vice President
Date founded: 1963
No. of employees: 250; 50 percent devoted to on-line services
Primary customers: consumer packaged goods manufacturers, end users, advertising agencies
Sales concentration: nationwide

Product line: provides interactive and batch processing services. The applications available through both on-line and off-line processing include: marketing information systems; decision support systems; electronic store scanner data analysis; questionnaires and store audit data analysis; sales analysis; marketing analysis and strategy; advertising and media systems; and consumer diary panel analysis. The company also provides consulting and analytical services, litigation support and expert witness.

Management Systems Corp.
5201 Green Street
Salt Lake City, UT 84123
(801) 264-2400

Vendor did not respond to update requests.

Principal business:
—on-line computer service company
—software vendor

Applications emphasis: accounting; insurance; medical and health care

President: Ray R. Hansen
Date founded: 1969
No. of employees: 105
Rev. last FY: $10M-$19M
Primary customers: end users
Sales concentration: nationwide

Product line: provides time-sharing and remote job entry services. Offers software for accounting and financial applications, medical clinics, and claims processing.

Managistics, Inc.
32-31 57th Street
Woodside, NY 11377
(718) 545-6200

Principal business:
—on-line computer service company
—off-line computer service company

Applications emphasis: payroll and personnel

President: Steve Murphy
Date founded: 1968
No. of employees: 250; 30 percent devoted to on-line services
Primary customers: end users; services vendors
Sales concentration: Philadelphia, PA; New York, NY; Long Island, NY—serving end users in Eastern corridor; home office sales to service vendors nationwide.

Product line: provides payroll and personnel related data services for thousands of companies in the eastern corridor. This service is provided either in traditional or off-line features. Among these is PayNet, the first on-line payroll service which allows customers to enter payroll data, do inquiries, as well as design and produce custom reports at their office.

ManTech Services Corp.
2121 Eisenhower Avenue
Alexandria, VA 22314
(703) 838-5700

Subsidiary of: ManTech International Corp.

Principal business:
—on-line computer service company
—off-line computer service company
—maintenance company
—consultants

Applications emphasis: accounting; data management and database management; engineering and scientific; government; management sciences; payroll and personnel; sales and distribution; construction

President: R.P. Gregory
Date founded: 1969
No. of employees: 80
Rev. last FY: $1.0M-$4.9M
Primary customers: commercial and government clients

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Company Profiles—J-R

Product line: provides interactive and batch processing. Available applications range from accounting to process control to list maintenance.

Manufacturing Decisions Support Systems, Inc.

300 East Ohio Building, 1717 East Ninth Street
Cleveland, OH 44114
(216) 861-8100

Principal business:
- —software vendor, selling software for use with Hewlett Packard 3000 series
- —on-line computer service company
- —consultants

Applications emphasis: accounting; manufacturing; sales and distribution; purchasing management; inventory control; accounts receivable; accounts payable; general ledger; financial reporting; cost accounting; sales analysis; forecasting

President: Milton N. Allen, Chairman
Director of marketing: John A Liebert, President and Director of Marketing
Date founded: 1968
Primary customers: manufacturing companies
Sales concentration: U.S.A. and Canada

Product line: provides on-line processing, software and consulting services for manufacturing companies. The on-line service operates through remote CRT terminals, personal computers, and printers. Complete software is available for in-house computers operating on the HP 3000, and on the IMAGE database system. The system may be run as an interrelated package or as a series of stand-alone segments. MDSS customizes to meet a client's particular manufacturing needs. Available applications include product data control; product costing; master production scheduling; manufacturing requirements planning; inventory management; purchasing management; shop floor control; job cost and labor efficiency; sales orders and invoicing; marketing management and sales analysis; accounts receivables; accounts payables; general ledger; and financial reporting.

Manus Services Corp.

1130 Rainer Avenue, South
Seattle, WA 98144
(206) 325-2200

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor, selling software for use with Digital Equipment Corp. PDP-11
- —database consultants

Applications emphasis: accounting; payroll and personnel; sales and distribution; distribution accounting; direct mail

President: Clifford Asplund
Director of marketing: Larry Granston
Date founded: 1969
No. of employees: 100; 50 percent devoted to on-line services
Rev. last FY: $5.0M-$9.9M; 80 percent from on-line services
Primary customers: end users
Sales concentration: Seattle, WA; Portland, OR

Product line: offers time-sharing and batch processing services to customers in the Pacific Northwest. Primary services include general accounting, wholesale distribution, and direct response marketing. Specialty markets include automotive parts warehouse distributor systems, and fuel oil dealer systems.

Marketron

101 Lincoln Centre Drive, Suite 300
Foster City, CA 94404
(415) 341-4004

Principal business:
- —on-line service company
- —broadcast computer service company
- —computer system manufacturer

Applications emphasis: media; sales and market information; market research

President: Jerome P. Cronin
Date founded: 1971
No. of employees: 73
Rev. last FY: $5.0M-$9.9M
Primary customers: television and radio stations, media agencies, media representatives
Sales concentration: national

Product line: provides a sales and research system with on-line access to audience listening and viewing data researched by The Arbitron Company, Birch, and A. C. Nielsen Company. Time-sharing services are provided through the Woodland Hills data center. This service is available in-house. Other broadcasting applications include in-house minicomputers, self-assembled for traffic and accounting business applications for television and radio stations.

Future plans: intends to expand their current services and systems to include new software programs and hardware configurations.

Marmen Computing

P.O. Box 176, 125 6th Avenue
Menominee, MI 49858
(906) 863-2611

Principal business:
- —on-line computer services company

Applications emphasis: accounting; data communications; data management and database management; government; manufacturing; payroll and personnel; sales and distribution

President: Barry A. Berquist
Director of marketing: John Hofer

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Company Profiles—J-R

Date founded: 1970
No. of employees: 42; 50 percent devoted to on-line services
Sales concentration: home office

Product line: provides on-line access to various special purpose databases, and custom system design, programming, and software maintenence. The company also provides management and technical consulting in the areas of data communications, DBMS, and industry specific applications. Marmen Computing's software will run on IBM 4341 systems.

Future plans: the company plans to expand its data communications system to allow its databases to be accessed nationwide.

Marshall & Swift

1200 Route 22
Bridgewater, NJ 08807
(201) 231-8920

Principal business:
—on-line computer service company
—database publisher
Applications emphasis: construction
President: Timothy Marshall, CEO
Director of marketing: Kevin M. Keegan, Vice President of Marketing
Date founded: 1932
Primary customers: appraisers; insurance companies, real estate agents; federal, state, and local governments; and construction industry
Sales concentration: New Jersey

Product line: provides building cost services for professionals in construction, insurance, real estate, and assessment throughout the United States and Canada. This information is used to estimate new and/or repair and remodeling construction costs for commercial and residential buildings. The company also provides depreciation information to determine insurable values, market values, and tax assessment. This service is published under three titles (*Residential Cost Handbook*, *Marshall Valuation Service*, and *Valuation Quarterly*), and is also available on-line via a phone and terminal, or on the IBM–PC or XT and other compatible systems.

Martin Marietta Data Systems (MMDS)

6303 Ivy Lane
Greenbelt, MD 20770
(301) 982-6500

Subsidiary of: Martin Marietta Corp.

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—computer system manufacturer
—consultants
Applications emphasis: accounting; banking and finance; data communications; data management and database management; education; engineering and scientific; government; management sciences; manufacturing; mathematics and statistics; medical and health care; payroll and personnel; transportation; project management

President: Richard J. Walters
Director of marketing: Kimberly Bruce
Date founded: 1970
No. of employees: 4200
Rev. last FY: $50M or more
Primary customers: financial institutions, business related database categories
Sales concentration: worldwide

Product line: provides computing services, applications systems, and professional services to business, industry, government, and financial institutions around the world. MMDS' major computing center has one of the largest installations of IBM equipment in the country, including four 3081s, added during 1981 alone. Another center is a CDC-processing center. Access to these centers is provided 24 hours a day, 7 days a week via a nationwide communications network, using either dedicated terminals connected to nationally and strategically placed network nodes, as well as dial-up. Provides applications systems software for manufacturing, financial, engineering, scientific, and general business users. Software is available off-the-shelf, customized, and custom-built. The professional services group provides expertise in technical areas, as well as in functional skills such as manufacturing resource planning and hospital administration management. MMDS offers trained professionals in system development, consulting services, systems and programming, facilities management, and education and training.

Master Data Center, Inc.

29100 Northwestern Highway, 300 Franklin Center
Southfield, MI 48034-1095
(313) 352-5810

Principal business:
—on-line service company
—software vendor
Applications emphasis: legal; patents; trademarks

President: Peter J. McAteer
Director of marketing: Ronald C. Knudson
Date founded: 1971
No. of employees: 28
Rev. last FY: $1.0M-$4.9M
Primary customers: legal professionals; corporate and law firms
Sales concentration: nationwide

Product line: provides on-line, interactive software and services related to legal data management, particularly for patent, trademark, and licensing information. Systems operate on IBM PCs, mainframes, and Wang VS computers.

MBA Systems Automation

611 E. Webber Road
Columbus, OH 43211
(614) 447-0100

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Company Profiles—J-R

Principal business:
- —on-line computer service company
- —software vendor, selling software for use with Digital Equipment Corp. PDP-11/70/VAX
- —maintenance company
- —consultants

Applications emphasis: data communications; data management and database management; engineering and scientific; word processing; text processing; mailing list generator

President: Schumann Rafizadeh
Director of marketing: Michael Drapp
Date founded: 1979
No. of employees: 14; 100 percent devoted to on-line services
Rev. last FY: $500K-$999K
Primary customers: end users
Sales concentration: home office

Product line: provides time-sharing services. The packages available include engineering systems; software development tools; database management systems; and word, text, and list processing. Also provides educational courses and seminars on database management and software development tools.

McDonnell Douglas Communications Industry Systems Company

5299 D.T.C. Boulevard, Suite 1400
Englewood, CO 80111-3305
(303) 220-6000

Principal business:
- —on-line information service company
- —software development
- —systems integration

Applications emphasis: administrative systems; financial services; data management and database management; data communications; engineering and scientific; facility design and management; purchasing management; work force management

President: P.D. Scholten
Director of marketing: J.M. Ross
Date founded: 1967
No. of employees: over 300
Primary customers: telecommunications industry companies
Sales concentration: nationwide, seven regional offices

Product line: provides information systems for the mechanization and system integration of major telecommunications functions including facilities administration; facilities assignment; customer services; communications and network management; CAD/CAE for telecommunications ISP/OSP engineering and asset management; and work force management. Also provides professional services, specialized consulting, and data processing services.

McDonnell Douglas Health Systems Company

600 McDonnell Boulevard
Hazelwood, MO 63042
(314) 232-9861

Subsidiary of: McDonnell Douglas Corp.

Principal business:
- —on-line computer services company
- —software vendor, selling software for IBM, Digital Equipment Corp., and Tandem processors
- —database producer
- —maintenance company

Applications emphasis: medical and health care; administrative systems; patient statistics; patient accounting; microbiology systems

President: Frank V. Stefanik Jr., Executive Vice President and CEO
Director of marketing: David M. Rousseau, Vice President, Marketing and Planning
Date founded: 1970
No. of employees: 2,000; 50 percent devoted to on-line services
Rev. last FY: $200M or more; 50 percent from on-line services
Primary customers: health care industry—hospitals, physician offices, clinics, independent laboratories, etc.
Sales concentration: nationwide

Product line: provides the following services: HFC—shared financial information system; IHS—standalone financial and patient care system; MHS—in-house minicomputer-based financial information system; PCS—patient care results reporting system; HDC—patient data communication and collection system; Medical Records System—microcomputer-based information abstracting system; PathCom—laboratory information management system; RxCom—pharmacy information management system; RadCom—radiology information management system; and decision support systems, including systems for cost management, food management, material management, nurse management, operating room management, and physician office management.

Future plans: expansion of services to continually meet the needs of the health care industry.

McDonnell Douglas Information Systems Group

Box 516
St. Louis, MO 63166
(314) 232-9551

Subsidiary of: McDonnell Douglas Corp.

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor, selling software for use with IBM, Data General, and Digital Equipment Corp. equipment
- —hardware manufacturer
- —field service company

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Company Profiles—J-R

—consultants; Turnkey CAD/CAM vendor
—network vendor

Applications emphasis: accounting; data management and database management; engineering and scientific; government; insurance; management sciences; manufacturing; mathematics and statistics; medical and health care; sales and distribution; transportation; inventory control; order processing; structural engineering; patient registration and scheduling; fixed assets; patient accounting; patient statistics; materials management; budget systems; nursing unit order entry and charge systems; materials requirements planning

President: J.J.Cansby
Director of marketing: W.W. Hudgins
Date founded: 1960
No. of employees: 12,000
Primary customers: health services, telecommunications industry, manufacturing and engineering, financial services, wholesale and retail distribution, applied communication
Sales concentration: worldwide

Product line: provides complete information systems, from hardware and software to field support and networking, to a wide range of industries. Products include Tymnet public and private networks; computer hardware and software; the TeleCheck check acceptance service; EDI*Net, a leading electronic data interchange system; and a wide range of systems in health information, diagnostic services, CAD/CAE/CAM, applied communications, and professional services.

McDonnell Douglas Physicians Systems
2140 W. 190th Street
Torrance, CA 90504
(213) 320-1101

Principal business:
—on-line computer service company
—computer system manufacturer
—maintenance company
Applications emphasis: accounting; medical and health care

Director of marketing: Bill Enoch
Date founded: 1969
No. of employees: 200; 95 percent devoted to on-line services
Primary customers: medical groups, clinics, and schools
Sales concentration: home office; San Jose, CA; Chicago, IL; Dallas, TX

Product line: provides time-sharing services. Available applications are in the medical accounting area. Nationwide access is provided.

McGraw-Hill/Dodge Cost Systems
1101 State Road, Building D, P.O. Box 28
Princeton, NJ 08540
(609) 426-7300; (800) 257-5295

Principal business:
—on-line computer service company
—off-line computer service company
—construction cost data
Applications emphasis: construction

Director of marketing: Frank Benz, V.P. and General Manager
Date founded: 1950
No. of employees: 30; 30 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M
Primary customers: construction and design industry
Sales concentration: home office

Product line: provides time-sharing and batch processing services for construction cost estimating. Offers three basic systems for construction cost estimating which include: System 1 used for detailed estimating; System 73 for design estimating; and System 90 for budget estimating. A construction materials database and a labor rate database are available for use in conjunction with the estimating systems. Nationwide access is available. Other products from the company include such IBM PC-compatible estimating packages as *Design Estimator II*, *Painting T/D Estimator*, and *Dodge Square Foot Data.*

Medical Information Technology, Inc. (MEDITECH)
MEDITECH Circle
Westwood, MA 02090
(617) 329-5300

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—maintenance company
—consultants
Applications emphasis: data management and database management; government; legal; medical and health care; payroll and personnel; sales and distribution; accounting

President: A. Neil Pappalardo
Director of marketing: Edward Pisinski
Date founded: 1969
No. of employees: 315
Rev. last FY: $20M-$50M; 33 percent from on-line services
Primary customers: hospitals, clinics, commercial medical laboratories, state government, health maintenance organizations
Sales concentration: home office

Product line: sells software to medical and commercial markets worldwide. System software and application software modules are sold to hospitals for ancillary, financial and hospital information systems. Service options include: 1) time-sharing, 2) facilities management, 3) rental, and 4) licensing or outright purchasing using Digital Equipment Corp. and Data General hardware. Output provided includes hard copy, microfiche, or microfilm.

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Company Profiles—J-R

Meincke, Pearce & Company

397 Park Avenue, P.O. Box 270
Orange, NJ 07051
(201) 672-8887

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with Hewlett-Packard 3000
—facilities manager
—maintenance company
—consultants
Applications emphasis: accounting; banking and finance; legal

President: Arthur Olson
Director of marketing: Peter Larina
Date founded: 1978
Rev. last FY: $600K
Primary customers: financial institutions, legal corporations
Sales concentration: home office

Product line: provides on-line access to customized applications for banks, financial, legal, and professional institutions. The legal and professional applications perform calendar tracking, billing, and timekeeping with an integrated general ledger. In addition, the company offers consulting and programming support for all products.

Membership Services, Inc. (MSI)

2727 Chem Search Blvd
Irving, TX 75062
(214) 438-0805

Subsidiary of: National Chemsearch

Principal business:
—off-line computer service company
—software vendor, selling software for use with IBM PCs and compatibles; Texas Instrument 1515; IBM Personal System 2
—consultants
Applications emphasis: non-profit services

President: Joe Cleveland
Director of marketing: Laura Spencer
Date founded: 1968
No. of employees: 100; 25 percent devoted to on-line services
Primary customers: churches
Sales concentration: nationwide

Product line: provides data processing products, services, and consulting to churches and other nonprofit organizations. Service bureau operations and in-house minicomputer and microcomputer systems are sold nationwide with 1,100 customers in 43 states.

Future plans: continue to take advantage of changes in technology.

Midwest Commerce Data Corp.

2020 Industrial Parkway
Elkhart, IN 46516
(219) 294-6621

Subsidiary of: Midwest Commerce Corp.

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with Datapoint, IBM 4241; IBM 370/145; NCR 8555
—consultants
Applications emphasis: accounting; banking and finance; payroll and personnel; accounts receivable; accounts payable; general ledger; fixed assets; time accounting; country club accounting procedures

President: Richard L. Hershberger
Director of marketing: Najeeb A. Khan
Date founded: 1970
No. of employees: 150; 30 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M
Primary customers: banks, savings and loans, manufacturers, distributors
Sales concentration: all sales out of home office

Product line: provides dedicated on-line and batch services. On-line financial services are provided for savings and loan associations. Batch processing includes payroll, accounts receivable, accounts payable, general ledger, fixed assets, professional time accounting, and country club billing. Hard copy is available for on-line and batch services. Produces microfilm and microfiche for companies with in-house computers. Sells Datapoint computers with applications software. PC software is available for uploading and downloading to an IBM host.

Midwest Data Systems, Inc.

1 Insurance Square
Celina, OH 45822
(419) 586-5181

Subsidiary of: Celina Financial Corp.

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—maintenance company
Applications emphasis: insurance

President: Martin A. Herf
No. of employees: 85
Rev. last FY: $7M
Primary customers: insurance companies and agents
Sales concentration: nationwide

Product line: provides time-sharing services for property and casualty insurance companies. Offers applications for policy processing. Also provides annual reporting

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Company Profiles—J-R

services and will file the insurance companies accounting statistics with any reporting bureau.

Mini-Probe Corp.
66-05 Woodhaven Boulevard
Rego Park, NY 11374
(212) 830-0110

Principal business:
—on-line computer service company
—software vendor
—facilities manager
—turnkey systems vendor
Applications emphasis: accounting; manufacturing; sales and distribution; inventory control; accounts receivable; accounts payable; general ledger; order processing; sales analysis; billing/invoicing/collection

President: George O'Malley
Director of marketing: Patrick Leech
Date founded: 1971
No. of employees: 14; 100 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 90 percent from on-line services
Primary customers: giftware importers, paper and stationary suppliers, cosmetic industry, chemical industry, garment industry
Sales concentration: home office

Product line: provides fixed-priced time-sharing and services to their clients in the Northeast coast region. Specialization areas include special custom pricing and inventory control applications for giftware importers, paper and stationary suppliers, and cosmetic and chemical companies. Applications are also available for accounts receivable, accounts payable, general ledger, order entry, invoicing, inventory control, garment billing, and sales analysis. The company also offers customized application design and provides conversion options for on-line users wishing to install an in-house Digital Equipment Corp. computer. Complete documentation and on-site training is available for both the on-line and in-house use.

MJK Associates
122 Saratoga Avenue, Suite 11
Santa Clara, CA 95051
(408) 247-5102

Principal business:
—on-line computer service company
—database producer
—off-line computer service company
Applications emphasis: banking and finance; investment analysis; commodities

President: Susan T. Held
Director of marketing: Michael A. Marriott
Date founded: 1972
No. of employees: 8; 75 percent devoted to on-line services
Rev. last FY: $500K-999K
Primary customers: commodity brokers, individual speculators, and financial advisors
Sales concentration: home office

Product line: produces a commodity data information service, (*CDIS*), which provides daily commodity contract and currency futures for 65 major commodities. The open, high, low, close, (settling), volume, open interest plus cash and selected indices are available at 13:45 Pacific time, 23 hours/day, 7 days/week. The on-line database extends back to 1969. Subscribers use standard programs to obtain such information as spreadsheets and histories, bar graphs, and moving averages. Customized programs can be created to research investment ideas, systematize trading guidelines, and test strategies. MJK's newest software package, *POISE* (*Portfolio Opportunities Investigated through Simulated Executions*), allows users to select a trading strategy, characterize its performance in the marketplace, and assess the risks and rewards of that performance. MJK's Data Retrieval Service, designed for the microcomputer owner equipped with an RS 232 communications interface, is completely user-controlled. Users may download any part of any contract or cash data, or generate and maintain a portfolio for daily updates.

Modern Language Association of America
10 Astor Place
New York, NY 10003
(212) 475-9500

Principal business:
—on-line computer service company
—database producer
—membership organization; publisher
Applications emphasis: humanities

President: Phyllis Franklin, Executive Director
Director of marketing: Judith Altreuter, Production Manager
Date founded: 1883
No. of employees: 60; 33 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 33 percent from on-line services
Primary customers: research libraries
Sales concentration: New York, NY

Product line: produces the Modern Language Association of America database. MLA is a membership organization and publisher of scholarly books. Regular publications include MLA International Bibliography (in print and on-line), MLA Directory of Periodicals, PMLA (journal), and MLA Newsletter. MLA also provides computer services to other scholarly societies. Services include text processing, membership files, accounting files, etc.

Money Management Systems, Inc.
303 Wyman Street
Waltham, MA 02154
(617) 890-2070

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Company Profiles—J-R

Subsidiary of: Strategic Information

Vendor did not respond to update requests.

Principal business:
—remote time-sharing services to the financial community
—software vendor, selling MoneyMarket II for use on in-house DEC/VAX computers
Applications emphasis: banking and finance; investment analysis

President: W. Benton Jones
Director of marketing: Robert E. Leahy
Date founded: 1976
No. of employees: 10; 40 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 50 percent from on-line services
Primary customers: commercial banks, financial institutions
Sales concentration: home office; New York, NY

Product line: provides money market operations processing capabilities on remote time-sharing or turnkey in-house computer systems basis. MoneyMarket II proprietary software provides support for the processing and management of trading, portfolio, safekeeping, and clearance activites of commercial banks and financial institutions as well as on-line information to traders and salespeople on positions, collateral, and customer activity.

Mountain West Research Southwest, Inc.
432 N. 44th Street, Suite 400
Phoenix, AZ 85008
(602) 273-1088

Principal business:
—on-line computer service company
—real estate consulting
—information products
Applications emphasis: data management and database management; management sciences; graphics; financial and statistical time series; real estate management
Date founded: 1982
No. of employees: 66
Primary customers: end users in the public and private sector
Sales concentration: home office; Western Arizona

Product line: provides time-sharing services through their Tempe, AZ computer center. The four major application areas are database management, statistical analysis, modeling systems, and graphics. The company also provides commercial and residential databases on demographic and economic real estate in the Phoenix metropolitan area.

MRCB Service Bureau
11633 Victory Boulevard
North Hollywood, CA 91609
(818) 509-1790

Principal business:
—on-line services company
—database producer
—off-line computer services company
—software vendor-IBM large mainframes under MVS and DOS/VSE
—facilities manager
—consulting, programming, and fulfillment
Applications emphasis: data communications; data management and database management; education

President: Richard Yung
Director of marketing: Jim Case, V.P. of Marketing
Date founded: 1978
No. of employees: 250; 40 percent devoted to on-line services
Rev. last FY: $10M-$19M; 100 percent derived from computer services
Primary customers: end users
Sales concentration: all sales out of home office; Southern California area, national, and international

Product line: provides on-line processing, time-sharing services, database management services, IDMS new product development, batch processing, consulting/programming services, IDMS education, remote job entry, laser printing, customized applications and systems software, a complete enhancement software product line, on-site and off-site professional IDMS education, and IDMS time-sharing services.

Future plans: to continue the above and develop a complete line of IDMS/R related software. Eventually MRCB plans to migrate to artificial intelligence applications.

Muller Data Corp.
111 Broadway
New York, NY 10006
(212) 766-9555

Subsidiary of: Muller & Company

Principal business:
—on-line computer service company
—database producer
Applications emphasis: banking and finance; securities; stock information; bonds

President: George Prefer
No. of employees: 50

Product line: provides municipal bonds evaluation services, on-line or batch; corporate stock and bond price dividends, via remote transmission or batch; dividend announcements services, mortgage-backed securities, prices and factors; international securities, and registered bond services, via remote transmission or batch.

Multinational Computer Models, Inc.
605 Bloomfield Avenue
Montclair, NJ 07042
(201) 746-5060

Company Profiles—J-R

Principal business:
- —database producer
- —software vendor, selling software for use with IBM PCs interacting with mainframes, international financial consultants

Applications emphasis: banking and finance; data management and database management; economics—international

President: Abraham M. George
Director of marketing: Dirck Snyder
Date founded: 1975
No. of employees: 18; 70 percent devoted to on-line services
Rev. last FY: $500K-$999K; 70 percent from on-line services
Primary customers: multinational corporations; banks; international financial institutions
Sales concentration: Montclair, NJ; Stamford, CT; New York, NY

Product line: provides extensive international financial applications. Also provides international financial and economic databases, including text databases for 125 countries. Primary emphasis of information services are country and currency risk, governmental policy directions, macroeconomics, foreign exchange, and controls and regulations. Other services are currency forecasts, macroeconomic forecasts, and software for managing foreign exchange exposures. PC based applications, interacting with data on mainframes, are currently provided.

Murdoch Magazines, Inc.
1156 15th Street, NW
Washington, DC 20005
(202) 822-4605

Subsidiary of: News Maeria Publishing, Inc..

Principal business:
- —on-line services company
- —database producer
- —electronic publishing

Applications emphasis: engineering and scientific; government; manufacturing; mathematics and statistics; transportation; aviation

Primary customers: end users, managers, information intermediaries
Sales concentration: worldwide, primarily out of home office

Product line: producers of the *Aerospace* and *Aviation Online* databases. Both databases contain aerospace and aviation related abstracts.

B.J. Murray, Inc.
140 Sylvan Avenue Suite 6
Englewood Cliffs, NJ 07632
(201) 585-2970

Principal business:
- —on-line services company
- —software vendor

Applications emphasis: accounting; property management

President: Brian J. Murray
Director of marketing: Frank DeLucia
Date founded: 1978
No. of employees: 25; 100 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 100 percent derived from computer services
Primary customers: property managers
Sales concentration: New York City Metropolitan area

Product line: offers on-line services to firms generally managing between 200 and 10,000 commercial or residential units. Services include tenant accounts receivable and accounts payable. Arrears reports and legal actions can also be maintained on the system. PMS (Property Management Systems), the name of the on-line system, also processes checks and journal entries for general ledger and financial statements, and produces rent invoices.

National Computer Network Corporation
175 W. Jackson - A1038
Chicago, IL 60604
(312) 427-5125

Principal business:
- —on-line computer service company
- —database producer
- —off-line computer service company
- —consultants

Applications emphasis: banking and finance; data communications; data management and database management; engineering and scientific; management sciences; mathematics and statistics; transportation; commodities; inventory control; securities; investor relations
President: James Leopold
Date founded: 1969
No. of employees: 18; 100 percent devoted to on-line services
Primary customers: brokers, banks, researchers, money managers, investment advisors
Sales concentration: home office

Product line: provides time-sharing services, consulting, and customized programs. Applications include: marketing forecasts, stock option analysis, stock and portfolio pricing, microcomputer programming, futures commodities analysis, CD rates, bankperformance data, and plotting and graphics. The program library contains over 200 programs for statistics, options data, business, engineering, financial, marketing, math, research, and commodities. The company also offers access to financial databases. Communication networks serve the United States and parts of Canada, Europe, Mexico and the Orient.

National Computer Systems
Highway 1 & Interstate 80
Iowa City, IA 52244

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Company Profiles—J-R

(319) 354-9200

Subsidiary of: Westinghouse Electric Corp.

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor
- —facilities manager

Applications emphasis: accounting; education; government; payroll and personnel; accounts receivable; accounts payable; student related information

President: Donald J. Gibson
Director of marketing: Joseph W. Nelson
Date founded: 1953
No. of employees: 800; 50 percent devoted to on-line services
Rev. last FY: $20M-$50M; 100 percent from on-line services
Primary customers: educational institutions, commercial industrial users, state/local/federal government
Sales concentration: nationwide; Caracas, Venezuela; Hong Kong; Dusseldorf, West Germany

Product line: produces software with major capabilities. Areas of software expertise include: payroll, personnel, financial management, financial accounting, financial aid management, accounts receivable, accounts payable, and student records, grades, attendance, loans, admissions, and alumni. The company also sells computer time for on-line and batch processing and develops administrative software systems for small and medium-sized colleges.

National Data Services, Inc.
21835 Nordhoff Street
Chatsworth, CA 91311
(818) 882-7360

Vendor did not respond to update requests.

Principal business:
- —on-line computer service company
- —off-line computer service company

Applications emphasis: accounting; legal; manufacturing; payroll and personnel; sales and distribution; general ledger; cost accounting; accounts payable; accounts receivable; fixed assets

President: Charles J. Flynn
Director of marketing: Marlene Robison
Date founded: 1963
No. of employees: 30
Primary customers: general business, accountants, manufacturers, distribution companies, political organizations
Sales concentration: home office

Product line: offers batch and remote job entry processing through its service bureau operation. Available packages include general ledger, payroll, job cost, accounts payable, accounts receivable, and fixed assets. Provides customized programming to user specifications for in-house processing and Datapoint computers.

Future plans: expansion of on-line and database applications.

National Decision Systems, Inc. (NDS)
539 Encinitas Boulevard
Encinitas, CA 92024
(619) 942-7000; (800) 882-6200

Vendor did not respond to update requests.

Principal business:
- —on-line computer service company
- —database producer
- —off-line computer service company

Applications emphasis: banking and finance; government; management sciences; manufacturing; media; medical and health care; sales and distribution; transportation; real estate management; retail industry information; marketing; insurance

President: H. Michael Stansbury
Director of marketing: Craig Curtner, Director of Corporate Relations
Date founded: 1978
No. of employees: 110; 100 percent devoted to on-line services
Rev. last FY: $10M-$19M
Primary customers: real estate, marketing, advertising, financial institutions, retail, insurance brokres, media
Sales concentration: nationwide

Product line: a leader in the fields of demographic and marketing information, providing thousands of companies across the nation with a full range of reports, models, and analytical tools. NDS's complete line of Pop-Facts demographic reports include 1980 census data, current year estimates and five year projections. In addition, clients can customize their demographic reports by selecting from NDS' comprehensive database the specific demographic characteristics and geographic units they need to study. Potential retail sales data, shopping center square footage data and a Retail Saturation Index are provided in NDS' Expenditure Report. The name, location and square footage of every shopping center over 100,000 square feet located within a client selected trade area is provided in NDS' Shopping Center Report. (All of NDS' reports are available for any location/market in the U.S. and can either be mailed or accessed via a client's in-house terminal.) NDS also has developed a series of models and analytical tools to assist clients in analyzing and applying demographic data to evaluate sites and forecast sales success. *VISION*, NDS' advanced customer targeting and lifestyle segmentation system, identifies a client's best customers and prospects, where they live, what are their lifestyles and how they can be reached effectively. *Business-Facts*, the exclusive NDS database containing over 7 million U.S. businesses, gives clients all the competition and business data they need to quickly, easily list and evaluate the business market for any site or zip code they select. In addition, NDS has set an industry standard for accurate data with the exclusive "Circular Field" data retrieval system. NDS also has personalized Direct Line Service, economical prices, current data, and knowledgeable assistance.

National Information Systems, Inc.
1190 Saratoga Avenue
San Jose, CA 95129
(408) 985-7100

Principal business:
—on-line computer service company
—software vendor
—facilities manager
Applications emphasis: data management and database management; project management; facility design and management; accounting

President: Arden P. Scott
Director of marketing: Bill Mulert
Date founded: 1972
No. of employees: 30; 20 percent devoted to on-line services
Primary customers: aerospace companies, financial institutions, electronics
Sales concentration: San Francisco, San Jose

Product line: offers time-sharing services to the Western United States and other areas of the U.S. via Tymnet. Areas of specialization include data management and modeling applications. Packaged software products include Accent R, DBMS, 4th GL, and VUE project management.

National Planning Data Corp. (NPDC)
P.O. Box 610
Ithaca, NY 14851
(607) 273-8208

Principal business:
—on-line computer services company
—database producer
—off-line computer services company
—software vendor
Applications emphasis: census data; demographics; market research; thematic mapping

President: Douglas C. Salter
Director of marketing: James D. Spear, Vice President, Sales and Marketing
Date founded: 1969
No. of employees: 75; 15 percent devoted to on-line services
Primary customers: market researchers and those performing site location analysis
Sales concentration: home office; nationwide distribution, with sales offices in Pittsburgh, PA, Dallas, TX, and Los Angeles, CA

Product line: creates small-area demographic estimates and projections and processes census and other demographic data. Annually, NPDC produces its *UPDATES* series of current estimates and five-year projections of key demographics such as population, age, and income. In addition, NPDC maintains an extensive collection of tapes from the 1980 Census, and provides custom extracts and processing of this data. NPDC's *UPDATES* and selected 1980 Census data are also available through *MAX*, NPDC's Demographic Data and Reporting System. NPDC also provides thematic mapping services and mapping software for the IBM PC and compatibles. Data are available by state, county, place, census tract, zip codes, and custom aggregations of these geographics.

Future plans: continued development of unique demographic databases, and the development of analytical software for *MAX* and for microcomputers.

National Telecomputing Corp.
P.O. Box 257
Nyack, NY 10960
(914) 358-2335

Principal business:
—on-line computer services company
—software vendor
—videotex service
Applications emphasis: general interest database categories; videotex; media

President: James J. Clyde
Director of marketing: Glenn V. Carella
Date founded: 1982
No. of employees: 11; 100 percent devoted to on-line services
Rev. last FY: $200K-$499K; 100 percent derived from computer services
Primary customers: small businesses, computer clubs, home market
Sales concentration: large user groups; Northeastern states

Product line: offers reduced rate electronic mail and other videotex services to the home market at minimal fees. Off peak times (8 p.m. to 8 a.m.) permit a flat rate charge of $10 per month for unlimited connect time. The database features include news and business information (press releases from major business groups and trade associations, third party articles, papers from professional conferences, etc.); letters to the editor (public forum on topics of public interest); and on-line sales (home care and health products, computer hardware, software, and supplies). Products are shipped to customer (with the exception of downloadable software). Paid advertising and a percentage of gross on-line sales supports the service.

Future plans: increasing baud rates to 2400 bps

National Time Sharing and Data Services, Inc.
1342 Military Road
Niagara Falls, NY 14304
(716) 297-0553; (800) 255-0670

Subsidiary of: Conbow Corp.

Principal business:
—on-line computer service company
—off-line computer service company

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Company Profiles—J-R

Applications emphasis: accounting; government; manufacturing; payroll and personnel; general ledger; accounts receivable; accounts payable; inventory control; billing/invoicing/collection; municipal accounting procedures

President: Dr. Charles G. DeWald
Director of marketing: Bruce Cowe, Executive V.P.
Date founded: 1968
No. of employees: 65; 20 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 100 percent from on-line services
Primary customers: membership billings, manufacturing, government
Sales concentration: Eastern U.S.

Product line: provides time-sharing, retail applications, contract programming, municipal and manufacturing MIS, voter registration, data entry, consulting services, list management, doner tracking, and laser and impact printing. Available applications include general ledger, accounts receivable, accounts payable, inventory control, product costing, municipal accounting, billing, invoicing, and production scheduling.

Future plans: intends to open a branch office in New York City in 1988.

NCR Data Services Division
1700 S. Patterson Boulevard
Dayton, OH 45479
(513) 445-4600

Subsidiary of: NCR Corp.

Principal business:
—on-line computer service company
—off-line computer service company
—facilities manager
—electronic funds transfer network services company
—COM processing services company
Applications emphasis: banking and finance; retail trade data; accounts receivable; accounts payable; financial reporting

President: J.D. Wise, Assistant Vice Presidents
Director of marketing: D.R. Burns
No. of employees: 1,000
Primary customers: thrift institutions, commercial banks, retail stores
Sales concentration: nationwide

Product line: provides on-line services to thrift institutions, commercial banks, and retail stores. The STARCOM Financial System provides real-time account processing and a complete management information system for the thrift industry. The Central Information File (CIF) System offers account processing and reporting for commercial banks through an integrated database that links all the accounts for a customer through a common reference number. The STARCOM Retail System provides a comprehensive management information system for the retail industry consisting of merchandise planning, purchase order management, inventory management, unit control, accounts payable, accounts receivable, and financial reporting. The company also offers a computer output microfiche service (COM), with local centers converting magnetic tape into easy-to-use, easy-to-store microfiche.

Network Associates
200 Fifth Ave. S.E., P.O. Box 4828
Cedar Rapids, IA 52407
(319) 398-1800

Principal business:
—on-line computer service company
—software vendor, selling software for use with Data General MV 15000 series; IBM 30XX, 43XX
Applications emphasis: insurance

President: John D. Ballard
Director of marketing: Larry J. Doze
Date founded: 1956
No. of employees: 70; 90 percent devoted to on-line services
Primary customers: life and health insurance companies
Sales concentration: home office

Product line: provides on-line and batch computer processing for new and established individual life and health insurance companies. The system includes on-line entry of new, changed, or terminated policy information; maintenance of accounting journals, product portfolios, and agent information. Performs administrative functions; such as, updating and maintaining policy and accounting history files, generating policy reports, and generating summaries of financial and actuarial valuation reports. The company also provides consulting and programming services. Universal life, interest-sensitive life, and flexible annuity systems are available.

Network Computing Corp.
5301 77 Center Drive
Charlotte, NC 28217-2703
(704) 525-8810

Principal business:
—on-line computer service company
—software vendor
—turnkey systems
Applications emphasis: accounting; data management and database management; utility management; billing/invoicing/collection; accounts payable; general ledger; budget systems; labor force information; inventory control; job cost accounting; financial services

President: James V. Tomai
Director of marketing: Keith M. Eades
Date founded: 1971
Primary customers: utilities and municipalities
Sales concentration: home office

Product line: provides utility billing and consumer information management systems for electric, water, wastewater, refuse collection, and gas utilities of all sizes. Thes company also provides over-the-counter cash collections systems; postal discount (ZIP+4) software; and financial systems, including general ledger/accounts, payable/bud-

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Company Profiles—J-R

geting, payroll, materials inventory/work order, accounting, property records (electric), and equipment/vehicle accounting. Personal computer interfaces and file transfer capabilities are also provided.

News-a-tron Corp.
One Peabody Street
Salem, MA 01970
(617) 744-4744

Principal business:
- —on-line computer services company
- —database producer

Applications emphasis: banking and finance; stock information

President: Louis G. Rossi
Date founded: 1980
No. of employees: 7; 100 percent dedicated to on-line services
Rev. last FY: $200K-$499K
Primary customers: semiprofessionals, consumers, and end-users

Product line: provides authoritative news and analytical features on the commodity and financial markets. Among the company's products are News-a-tron Market Reports, which provide a timely interpretation and analysis of the fundamental news stories and technical factors that influence the marketplace.

Noesis Computing Company
615 Third Street
San Francisco, CA 94107
(415) 495-7440

Principal business:
- —on-line computer service company
- —software vendor, selling software for use with Hewlett-Packard 3000

Applications emphasis: accounting; order processing; membership management systems

President: Robert V. Scavullo
Director of marketing: Robert V. Scavullo
Date founded: 1976
No. of employees: 12; 50 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 60 percent from on-line services
Primary customers: trade associations
Sales concentration: San Francisco, CA; Washington, DC

Product line: provides an on-line service bureau offering Powerhouse, Fourth Generation DBMS, Multiview Accounting, and DSG/3000 Graphics. Clients access via CRT terminals and personal computers.

Norsk senter for informatikk (NSI)
Brobekkvn, 80 Postboks 1156, Sentrum
0107 Oslo, Norway
(02) 64 08 88

Principal business:
- —on-line computer services company
- —database producer
- —off-line computer services company
- —software vendor

Applications emphasis: banking and finance; education; engineering and scientific; government

President: Hans Kristian Krogh
Director of marketing: Odd Haugsteit
Date founded: 1944
No. of employees: 35; 10 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 90 percent derived from on-line services
Primary customers: Norwegian industry
Sales concentration: Scandanavia

Product line: offers 11 publicly available on-line databases. A search system developed by the company called *Polydoc*, is part of a software package for data entry, storage, and retrieval of information. Nine of the 11 databases contain bibliographic information. A computer-based course program provides instruction in the searching of the databases.

Northwest Management Services, Inc.
2323 Eastlake Avenue, East
Seattle, WA 98102
(206) 329-9990

Subsidiary of: Northwest Administrators, Inc.

Principal business:
- —on-line computer service company
- —off-line computer service company

Applications emphasis: accounting; banking and finance; pension services; union accounting services

President: R.G. Dawson, Chief Operating Officer
Date founded: 1967
No. of employees: 70; 100 percent devoted to on-line services
Primary customers: health and welfare pension administrators, savings and loans, unions
Sales concentration: home office; Burlingame, CA

Product line: provides on-line banking services for 30 Savings and Loans in 5 western states. On-line membership updating and accounting services for 10 unions in 3 states. Pension, health, and welfare accounting services for Northwest Administrators.

Numerax Inc.
230 West Passaic Street
Maywood, NJ 07607
(201) 368-0170

Subsidiary of: McGraw-Hill

Principal business:
- —on-line computer service company

Applications emphasis: transportation

President: Keith Keenan
Director of marketing: Frank Dellarosa, V.P. of Sales

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Company Profiles—J-R

Date founded: 1969
No. of employees: 300
Rev. last FY: over $10M; 50 percent from on-line services
Primary customers: shippers and receivers of goods; motor carriers
Sales concentration: National and Canada

Product line: provides on-line and batch processing services to companies incurring freight expenses. Numerax offers access to databases comprised of general and client specific freight rate information. The available applications include freight rating, auditing, payment, and transportation reporting from a history file which is client oriented. The company also offers tariff building to the motor carrier industry.

OCLC Online Computer Library Center, Inc.

6565 Frantz Road
Dublin, OH 43017
(614) 764-6000; (800) 848-5878

Principal business:
—on-line computer service company
Applications emphasis: library information systems

President: Rowland C. W. Brown
Director of marketing: Kenneth Harris, Vice President Marketing and User Services Division
Date founded: 1967
No. of employees: 500; 100 percent devoted to on-line services
Rev. last FY: $20M-$50M; 100 percent from on-line services
Primary customers: libraries

Product line: operates an international computer network used by libraries to acquire and catalog library materials, order custom-printed catalog cards, produce machine-readable bibliographic records, arrange interlibrary loans, and maintain local information on library material. OCLC is a nonprofit computer library service and research organization whose principal businesses are providing centralized and local turnkey systems to libraries.

Future plans: intend to put primary emphasis on developing and marketing of local systems to libraries which will provide an on-line public access catalog, authority control, and circulation control as well as other features.

On-Line Business Systems, Inc.

115 Sansome Street
San Francisco, CA 94104
(415) 391-9555

Principal business:
—remote computing services
—custom software development
—software sales
Applications emphasis: telecommunications; data management and database management; engineering and scientific; management sciences; manufacturing; labor force information; sales and distribution; insurance; petroleum; securities; oil and gas accounting procedures; real estate management; facility design and management; software development; data communications

President: Jeffery D. Stein
Director of marketing: Thomas E. Cohan, Vice President
Date founded: 1969
No. of employees: over 200
Rev. last FY: $20M-$50M; 90 percent from on-line services
Primary customers: end users
Sales concentration: western U.S.

Product line: provides time-sharing and remote batch processing with access to a variety of sophisticated transaction processing and database management tools. The company also develops and processes custom-tailored on-line applications and provides program software products. Custom systems include: hotel and tour reservations; on-line distribution; financial lease management; general processing for manufacturers and distributors; stock option trading; securities depository trust accounting; real estate investor information; oil and gas; and "off-site" facilities management. Users access data centers through the company's nationwide teleprocessing network.

On-Line Computer Systems, Inc.

660 Newport Center Drive
Newport Beach, CA 92660
(714) 644-1801

Principal business:
—on-line computer service company
Applications emphasis: banking and finance; general ledger; accounts payable; mortgage information; time accounting; individual retirement account processing

President: Ray Wells
Date founded: 1968
Primary customers: banks, savings & loans, thrift & loans, financial institutions
Sales concentration: West Coast

Product line: provides real-time services to financial institutions in the Western United States. Available systems include demand deposit accounting, time deposit accounting, certificate of deposit, individual retirement accounts, commercial loans, consumer loan, leases, floor plan, general ledger, accounts payable, mortgage loans, central information file, and collection management system.

On-Line Research, Inc.

200 Railroad Avenue
Greenwich, CT 06830
(203) 661-1395

Principal business:
—on-line computer service company
—software vendor
Applications emphasis: direct mail; tax related information; real estate management

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Company Profiles—J-R

President: Frank E. Wolf
Director of marketing: Sandra Lance
Date founded: 1978
Rev. last FY: $200K-$499K
Sales concentration: home office

Product line: provides time-sharing, software development databases, U.S. Census of Agriculture, Frost & Sullivan Research Report Abstracts, sales analysis, direct mail marketing, merge/purge, name and address processing, electronic newsletters, data entry services, service bureau functions, inventory and mail order fulfillment, commercial real estate data services, and software development.

Online Resource Exchange, Inc.
601 Poydras Street, Suite 2011, Box 48
New Orleans, LA 70130
(504) 581-1806

Principal business:
- on-line services company
- database producer
- off-line services company

Applications emphasis: oil and gas exploration

President: Max E. Maxwell
Director of marketing: Robert H. McCullough Jr.
Date founded: 1984
No. of employees: 8; 100 percent devoted to on-line services
Primary customers: major and independent oil companies
Sales concentration: Texas, Louisiana, Oklahoma, and Colorado

Product line: operates the *Exchange*, a database accessed directly by buyers and sellers of producing oil and gas properties. Sellers can list entire data packages of their sale property from their office. Buyers can search the database for properties that meet their acquisition criteria. The *Exchange* increases sellers market exposure and provides buyers with increased selection of properties. In addition to providing the information, the *Exchange* assists in gathering engineering, geologic, and land data that may be required.

PCS Data Processing, Inc.
140 Cedar Street
New York, NY 10006
(212) 964-4646

Principal business:
- on-line computer service company
- off-line computer service company
- facilities manager
- consultants

Applications emphasis: accounting; sales and distribution; order processing; inventory control; sales analysis; tax calculation/budgeting/processing

President: Stanley Berger
Director of marketing: Bert Rodd
Date founded: 1955
No. of employees: 55; 100 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 100 percent from on-line services
Primary customers: book publishing companies
Sales concentration: home office

Product line: offers on-line and batch processing services. The company provides a daily processing package for the book publishing industry. Available applications include order processing, inventory, sales analysis, accounting, royalties, back order, selection, list maintenance, and taxes. The company also offers stand-alone applications which include accounts receivable, accounts payable, general ledger/financial reporting, and list maintenance.

Pentamation Enterprises, Inc
1 Bethlehem Plaza
Bethlehem, PA 18018
(215) 691-3616

Principal business:
- on-line computer services company
- off-line computer services company
- software vendor, selling software to run with IBM 4000 series; Digital Equipment Corp. VAX line
- facilities manager
- custom programming
- consulting to health, education, and government

Applications emphasis: accounting; data management and database management; education; engineering and scientific; medical and health care; payroll and personnel; medical office administration; patient registration and scheduling

President: Jeffrey P. Feather
Date founded: 1969
No. of employees: 500; 60 percent devoted to on-line services
Rev. last FY: $20M-$50M; 100 percent derived from on-line services
Primary customers: health care; education
Sales concentration: nationwide

Product line: offers medical and educational systems in an on-line environment. Pentamation provides comprehensive financial and patient care systems to hospitals and nursing homes; educational administrative systems to secondary school districts; physician billing and account management services/systems; and time-sharing services through affiliation with D&B Computing Services.

Future plans: continued growth in all major areas through marketing and acquisitions.

Photo Data, Inc.
923 Lewis
Rockville, MD 20851
(301) 770-0440

Principal business:
- on-line computer service company

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Company Profiles—J-R

Applications emphasis: media; typesetting

President: F. Scott Watkins
Director of marketing: Anthony Fazio
Date founded: 1958
No. of employees: 28; 60 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 100 percent from on-line services
Primary customers: U.S. Government, McGraw-Hill
Sales concentration: Washington, D.C.

Product line: provides on-line services to publishers which include computerized typesetting and data conversion services for database publications. Photo Data also provides word processing interface programs to many different systems through magnetic tape medium.

Photonet Computer Corporation
1001 South Bayshore Drive
Miami, FL 33131
(305) 374-0074; (800)-FOTONET

Principal business:
- —on-line computer services company
- —database producer

Applications emphasis: media; advertising; publishing industry services

President: Patricia Woodson
Director of marketing: Len Kaltman
Date founded: 1983
No. of employees: 6
Rev. last FY: $200K-$499K; 100 percent derived from on-line services
Primary customers: publishers; photographers; picture libraries
Sales concentration: home office

Product line: a research and communications network for stock photography. Editors, photo researchers, and other photo buyers are able to send photo requests on-line to any of the 35 major picture agencies or hundreds of professional photographers. Specialized databases list travel itineraries of leading photojournalists, and listings of newly available photographs.

Planning Research Corp. (PRC)
1500 Planning Research Drive
McLean, VA 22101
(703) 556-1000

Principal business:
- —on-line computer service company
- —off-line computer service company
- —facilities manager

Applications emphasis: data management and database management; engineering and scientific; government; mathematics and statistics; medical and health care; business related database categories; membership management systems

President: Wayne Shelton
Director of marketing: Paul O'Brien
Date founded: 1968
No. of employees: 2,000; 10 percent devoted to on-line services
Primary customers: associations, private industry
Sales concentration: home office

Product line: provides on-line, time-sharing, and batch processing services. Available applications include database management systems, membership database management, statistical reporting, and convalescent home data management.

Future plans: intends to introduce an on-line database system for federal contracts.

Polycom Systems Ltd.
90 Nolan Court, Unit 50
Markham L3R 4L9, Canada
(416) 449-3400

Principal business:
- —on-line computer service company
- —database producer
- —software vendor, selling software for use with Honeywell DPS8; Digital Equipment Corp. VAX; IBM 9370 series
- —facilities manager

Applications emphasis: data management and database management; insurance; financial management; investment reporting

President: R. Drury; CEO
Director of marketing: A. Francescut
Date founded: 1968
No. of employees: 70; 80 percent devoted to on-line services
Rev. last FY: $5.0M-$9.9M; 80 percent from on-line services
Primary customers: end users
Sales concentration: home office

Product line: provides services ranging from stock market applications to providing nationwide access to strategic corporate information. Computing services include an on-line interactive service, remote batch services, and "over-the-counter" batch services for clients who wish to schedule jobs for intermittent processing. Also available is an international network service which is accessible by telephone. Application products include financial information management and an applications library. The company also offers the *Rapidscan* database, which contains property insurance data for commercial properties in Canada; and *Autoplus*, a database service providing access to motor vehicle records and automobile loss histories.

PolySystems, Inc.
55 E. Jackson Boulevard
Chicago, IL 60604
(312) 663-5670

Principal business:
- —on-line services company

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Company Profiles—J-R

—software vendor
Applications emphasis: insurance

President: L.W. Schmitz
Director of marketing: Roger W. Smith
Date founded: 1970
No. of employees: 15; 80 percent devoted to on-line services
Primary customers: life insurance companies
Sales concentration: home office covering the continental U.S.

Product line: specializes in software and computer services for the life insurance company actuary.

Power Computing, Inc. (PCC)
1930 Hi Line Drive
Dallas, TX 75207
(214) 655-8694

Subsidiary of: Babcock & Wilcox

Principal business:
—on-line computer service company
Applications emphasis: nuclear related information; energy; utility management; government

Product line: provides computing services to utilities and energy industry members, as well as to other types of industries, businesses, and the federal government. These services range from designing and implementing utility management systems to processing structural design problems and providing micro-mainframe computer database systems. PCC also offers a broad range of applications software packages for use by the electric power industry. Large scale IBM and CDC Cyber hardware are installed at PCC.

Future plans: to continually upgrade its computer systems and services to provide customers with the most complete services available using the most advanced technology.

Prodata System, Inc.
2333 Western Avenue
Seattle, WA 98121
(206) 441-4090

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: accounts receivable; medical and health care; dental care

President: Robert Foster
Director of marketing: Andy Schellhas; Executive V.P. of Marketing
Date founded: 1958
No. of employees: 49; 50 percent devoted to on-line services
Primary customers: health care providers
Sales concentration: home office; Seattle, WA; Spokane, WA; Portland, OR

Product line: provides carefree (COS) "connected computing" services based on user installed terminals, printers, and IBM Personal Computers connected on-line to mainframes under CICS. Proprietary software called *A/R Easy On-Line* is used for medical and dental health care clients, with over ten years development and over 500 users. The company also provides network processing of multi-branch inventory and accounting for distributors in the northwest.

Professional Hospital Services
12960 Coral Tree Place
Los Angeles, CA 90066
(213) 822-2505

Subsidiary of: American Medical International

Vendor did not respond to update requests.

Principal business:
—on-line computer service company
—distributive processing
Applications emphasis: accounting; data communications; medical and health care; payroll and personnel

President: Revell B. Lamprecht
Date founded: 1977
No. of employees: 125; 100 percent devoted to on-line services
Primary customers: hospitals
Sales concentration: home office

Product line: offers distributive processing services for hospital financial systems and patient care information systems. This service provides real-time access and daily reporting at the hospital level. For weekly and monthly reports, hospitals telecommunicate sub-sets of their databases to the Professional Hospital Services computer for processing. Payroll checks, payroll check registers, and accounts receivable checks are transmitted via telecommunications to the client. Other reports, also available in microfiche, are couriered to the customer. The hospital financial system includes inventory, patient accounting, general ledger, financial reporting, payroll, labor management, personnel, and accounts payable. The patient care systems include service ordering; results reporting; admission, discharge, and transfer information; and general message switching.

Profitool, Inc.
1600 Stout St., Suite 1000
Denver, CO 80202-3135
(303) 571-1555

Principal business:
—on-line computer service company
—turnkey system vendor, selling software and Prime Computer 50 series minicomputers
Applications emphasis: construction; accounts receivable; accounts payable; general ledger; cost accounting; cost estimating systems; payroll and personnel; purchasing management

President: Gary M. Tamblyn

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Company Profiles—J-R

Director of marketing: Tom Levandoski
Date founded: 1977
No. of employees: 17; 20 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 30 percent from on-line services
Primary customers: construction companies
Sales concentration: international

Product line: provides data processing services and systems to the construction industry. The company's Contractor Management Information System (CMIS) is a completely integrated group of programs designed to perform the cost accounting and general accounting functions of the contracting firm. CMIS is a menu driven interactive, transaction processing software product, capable of providing real-time information to all levels of construction management. CMIS includes integrated modules for processing payroll, accounts receivable, accounts payable, purchasing, billing, subcontractor control, report writer, equipment cost and revenue, general ledger, job cost, scheduling, and estimating. Time-sharing clients access the services through the Profitool data center.

Programs & Analysis, Inc.
21 Ray Avenue
Burlington, MA 01803
(617) 272-7723

Principal business:
—on-line computer service company
—off-line computer service company
Applications emphasis: accounting; banking and finance; data management and database management; education; government; medical and health care; sales and distribution; sales analysis; trade union management; textiles; apparel related industry

President: Paul J. Brighton
Date founded: 1968
No. of employees: 120
Rev. last FY: $5.0M-$9.9M
Primary customers: cross-industry
Sales concentration: nationwide

Product line: provides time-sharing, remote batch, batch processing, and data entry computer services. The company operates multiple divisions. The Doc-Bill Division provides data processing services to the medical profession. An integrated administrative system for schools is offered through the Educators Consultant Service. Municipal Services Division offers tax billing, utility billing, receivable accounting, motor vehicle violation systems, and census/voter information systems. The health care management services are provided by Professional Health Systems. The Programming and Consulting Services Division provides expert consulting services to a wide range of data processing divisions and companies. A trade union data processing system is available through the Union Division. The company also provides garment industry and business applications and offers customized applications.

Progressive Management Services, Inc. (PMS)
2828 Anthony Lane South
Minneapolis, MN 55418
(612) 781-6521

Principal business:
—on-line computer service company
—software vendor, selling software for use with Digital Equipment Corp. PDP/11 and VAX
—consultants
Applications emphasis: accounting; manufacturing; sales and distribution; library information systems; inventory control; retail trade data; non-profit services

President: Jerry Miller
Director of marketing: Tom Youngquist
Date founded: 1972
No. of employees: 12; 95 percent devoted to on-line services
Rev. last FY: $20M; 100 percent from on-line services
Primary customers: educational institutions, retail/distribution organizations, professional services, manufacturing companies
Sales concentration: home office; San Diego, CA

Product line: provides on-line time-sharing services through a service bureau environment. Offers batch and distributive processing services on a limited basis. The on-line system has several important features which include: (1) user oriented English language communication with built in help messages; (2) unsurpassed documentation and manuals for all of our standard and customized software; and (3) thorough training, education, and support. PMS also offers customer training and consulting services at the clients' own sites. Their specialization and expertise lies primarily in the areas of wholesale/retail distribution (including cash register polling), manufacturing (including BOMP, MRP, shop floor control, inventory control, data collection, colleges and education, non-profit organizations and professional services.

Proprietary Computer Systems, Inc. (PCS)
16625 Saticoy Street
Van Nuys, CA 91406
(818) 781-8221

Principal business:
—on-line computer service company
—software vendor

Applications emphasis: accounting; banking and finance; report writer; investment reporting; payroll and personnel; construction; real estate management

President: Bill Barancik
Director of marketing: Roni Itagaki
No. of employees: 100
Primary customers: cross-country

Product line: offers financial applications for trust account-

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Company Profiles—J-R

ing, investment management, and real estate via time-sharing, remote batch, batch processing services, and technical publishing services. The company sells and leases its own proprietary software and is converting many of its packages to run on microcomputers.

Quantitative Medical Systems

5901 Christie Avenue, Suite 201
Emeryville, CA 94608
(415) 654-9200

Vendor did not respond to update requests.

Principal business:
—on-line computer service company
—consultants
Applications emphasis: medical and health care; patient treatment; patient accounting; kidney related information

President: John Sargent
Director of marketing: Sue Mironer
Date founded: 1975
No. of employees: 6; 100 percent devoted to on-line services
Primary customers: hospitals, physicians
Sales concentration: home office

Product line: provides on-line services to assist artificial kidney units in providing individualized patient treatment. Services include nutritional guidance, diet analysis, patient billing and records, therapy, and dialysis unit administration.

Quantitative Software Management, Inc.

1057 Waverley Way
McLean, VA 22101
(703) 790-0055

Principal business:
—software vendor
—consulting
Applications emphasis: cost estimating systems

President: Lawrence H. Putnam
Director of marketing: Douglas T. Putnam
Date founded: 1978
No. of employees: 10
Rev. last FY: \$500K-\$999K; 75 percent from on-line services
Primary customers: business, government
Sales concentration: home office

Product line: provides a strategic planning and capital budgeting tool called *Slim* that was designed to help senior managers estimate, control, and measure software development. Slim provides answers to critical management questions, and provides timely information to support a wide range of business situations.

Quantum Computer Services, Inc.

8619 Westwood Center Drive
Vienna, VA 22180
(703) 448-8700

Principal business:
—on-line services company
—database producer
—software vendor—Commodore 64 and 128
Applications emphasis: general interest database categories; news summaries

President: James V. Kimsey
Director of marketing: Stephen M. Case, V.P. of Marketing
Date founded: 1985
No. of employees: 70; 100 percent devoted to on-line services
Primary customers: Commodore 64/128 users

Product line: provides an on-line service to Commodore 64/128 owners. The service, called *QuantumLink*, includes news and information, a learning center, shopping center, realtime chat, full color interactive games, software catalog previews, and the Commodore Information Network.

Future plans: expanding service to other computer users.

Rapid Data, Inc.

215 North 5th Street
Redlands, CA 92374
(714) 793-2855

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor
—facilities manager
—minicomputer turnkey systems
Applications emphasis: accounting; banking and finance; government; manufacturing; medical and health care; payroll and personnel; sales and distribution; transportation
Date founded: 1962
No. of employees: 50; 100 percent devoted to on-line services
Rev. last FY: \$1.0M-\$4.9M; 100 percent from on-line services
Primary customers: end users
Sales concentration: home office

Product line: provides interactive time-sharing, batch processing, and in-house turnkey systems. Their area of specialization is customized applications. Develops applications or modifies existing or standard ones to fit specific user needs.

Real Estate Information Network

127 South Broadway P.O. Box 108
Nyack, NY 10960
(914) 358-2335

Principal business:
—on-line computer services company
—database producer
—software vendor
—computer system manufacturer
—maintenance company
Applications emphasis: accounting; banking and finance;

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Company Profiles—J-R

data communications; government; insurance; legal; real estate management; property management; tax related information

President: James J. Clyde
Director of marketing: John Fasulo
Date founded: 1980
No. of employees: 13; 60 percent devoted to on-line services
Primary customers: real estate brokers; attorneys; accountants; mortgage lenders; appraisers
Sales concentration: products sold by outside sales organizations with sales offices in New York; Dallas; and Washington, DC

Product line: provides on-line market data, financial information, and software. The company markets, on-line real estate information that includes current sales significant to market analysis, current and historical financing trends with information on specific lending institutions, leasing terms, income and operating statements, and cap rate studies. This information is useful to valuation of interest in real property for the following purposes: financing, investment analysis, property tax equality and assessment appeal, purchase versus lease, and other decisions concerning realty. Software to analyze the data available from Real Estate Information Network or other sources may be downloaded to users. The company can transmit text, data, programs, and pictures or graphics to users via standard telephone lines and will make certain information available to the public (for example, properties for sale or stock in a syndication).

Reference Technology, Inc.
5700 Flatiron Parkway
Boulder, CO 80301
(303) 449-4157

Principal business:
—on-line computer services company
—software vendor
—computer system manufacturer
Applications emphasis: media; bibliographic research

President: Stephen S. Smith
Director of marketing: Mike Befeler, V.P. of Marketing
Date founded: 1982
No. of employees: 53; 20 percent devoted to on-line services
Primary customers: value added resellers, information providers
Sales concentration: home office; Los Angeles, CA; Washington, DC; Dallas, TX; New York, NY

Product line: produces products based on laser optic technology, including CD-ROM. These products make information distribution and access economical, and provide a practical way for large databases to be delivered from the information source to the desktop, where the end users and their personal tools can use it. The Reference Technology *CLASIX* (Computer Laser Access Systems for Information Exchange) product line uses two basic components, the CD-ROM disc and the CD-ROM drive, as well as data preparation services and software for information providers.

Republic Service Bureau, Inc.
19110 Van Ness Avenue
Torrance, CA 90501
(213) 533-0211

Principal business:
—on-line computer service company
—off-line computer service company
—software vendor, selling software for use with IBM 360/370/43XX
Applications emphasis: accounting; legal; manufacturing; job cost accounting; payroll and personnel; sales and distribution; accounts payable; general ledger; accounts receivable; cost accounting; fixed assets; sales analysis; property management; billing/invoicing/collection; word processing; financial management

President: Jerome A. Sorkin
Director of marketing: Virginia Northington
Date founded: 1961
No. of employees: 125; 60 percent devoted to on-line services
Rev. last FY: $5.5M-$6.0M; 60 percent from on-line services
Primary customers: end user
Sales concentration: home office

Product line: provides a batch and on-line accounting system. Applications include accounts payable, general ledger, accounts receivable, job cost, fixed assets, profit and loss, cash flows, property management, sales analysis, billing, and payroll. Available on a multi-company, multi-bank, multi-fiscal year end, and cash and/or accrual basis. All applications are integrated into one system which is parameter driven to meet particular customer requirements.

Future plans: plans to provide CMS and report writer.

Retrieval Systems Associates, Inc.
4124-M Walney Road
Chantilly, VA 22021
(703) 631-8622

Principal business:
—on-line service company
—software vendor
Applications emphasis: banking and finance; data management and database management; government; legal; media; electronic mail

President: Jeff Entwisle
Date founded: 1984
No. of employees: 6
Rev. last FY: $200K-$499K
Primary customers: companies with Stratus or IBM Systen 88 computers
Sales concentration: home office

Product line: provides database development software, electronic mail, bulletin boards, conferencing software,

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Company Profiles—J-R

and full text retrieval

Rexnord Data Systems
4701 West Greenfield Avenue
Milwaukee, WI 53214
(414) 643-3703

Subsidiary of: Rexnord, Inc.

Principal business:
- —on-line computer service company
- —software vendor, selling software for use with IBM OS MVS
- —facilities manager
- —computer system manufacturer

Applications emphasis: management sciences; sales and distribution; management sciences; sales and distribution; facility design and management

President: Don Taylor
Director of marketing: Leon Todd
No. of employees: 13,000; 1 percent devoted to on-line services
Rev. last FY: $50M or more; 1 percent from on-line services
Primary customers: manufacturing; insurance; computer services
Sales concentration: nationwide

Product line: a remote computing service company offering commercially a Generic Computer Utility (GCU) which is a processing resource under IBM OS/MVS for remote computer processing; on-line time-sharing (TSO); overflow processing; and computer systems conversions. Computer related consulting services are also available which include training in the areas of TSO; SPF; IFPS; and FOCUS, as well as project management services for conversions and applications development. Various software products are available for lease in the areas of security system; customer service/distribution system; and project control billing system.

Future plans: full service, remote computer service company.

Reynolds + Reynolds
P.O. Box 1005
Dayton, OH 45401
(513) 443-2000

Principal business:
- —in-house computer service company
- —off-line computer service company
- —software vendor

Applications emphasis: business related database categories; automotive

President: Terry D. Carder
Director of marketing: Jack Proud
Date founded: 1866
No. of employees: 3,373
Rev. last FY: $50M or more; 60 percent from on-line services
Primary customers: automobile dealerships
Sales concentration: nationwide in the United States and Canada, Australia, South Africa

Product line: provides in-house and off-line services for management system applications used by automobile dealers. Available applications include accounting, parts inventory, payroll, inventory control, sales, and service management. The company also provides a number of applications for dealerships similar to automobiles; such as, motorcycle dealers, truck dealers, and marine dealers. The company also provides management systems are available for physicians, as well as accounting services.

Ross Systems, Inc.
1860 Embarcadero Road, Suite 208
Palo Alto, CA 94303
(415) 856-1100

Subsidiary of: ROSSDATA Corp.
Principal business:
- —software vendor, selling accounting and financial software for use with Digital Equipment Corp. VAX
- —on-line computer service company
- —consultants, custom applications
- —training

Applications emphasis: banking and finance; accounting; management sciences; financial planning; financial reporting

President: Kenneth Ross, Chief Executive Officer
Director of marketing: James Goetsch, V.P. of Marketing
Date founded: 1972
No. of employees: 120
Primary customers: end users
Sales concentration: home office; Palo Alto, CA; New York, NY; Nashua, NH; Bristol, United Kingdom

Product line: provides interactive time-sharing capabilities and overnight batch processing, as well as in-house installation. Services focus on financial and accounting systems. Ross Systems is the supplier of "mainframe class" financial management software for Digital's VAX minicomputers. The *MAPS* family of software products integrates accounting applications with decision support tools to address the needs of corporations in a wide variety of industries.

Rotelcom Corp.
930 Fairport Industrial Park
Fairport, NY 14450
(716) 381-3090

Subsidiary of: Rochester Telephone Corp.

Vendor did not respond to update requests.

Principal business:
- —on-line computer service company
- —off-line computer service company
- —software vendor, selling software for use with Digital Equipment Corp. PDP-11; VAX
- —consultants

Applications emphasis: data communications; data management and database management; legal; inventory

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control; budget systems; telecommunications; billing/invoicing/collection; telephone industry services

President: James C. Henderson
Director of marketing: Dennis Dundon
Date founded: 1980
No. of employees: 15; 75 percent devoted to on-line services
Rev. last FY: $1.0M-$4.9M; 60 percent from on-line services
Primary customers: telephone companies, SMDR cross-industry, resale common carriers

Sales concentration: home office

Product line: provides time-sharing and batch processing services through their Fairport data center. On-line applications include budget preparation, telecommunications, litigation, inventory control, and billing. Batch processing offers other services as well; such as, station message detail recording system. The company offers customized programming as well as data communications hardware and services.

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Company Profiles—S-Z (Addendum)

Solution Systems, Inc. (SSI)
114 Forrest Avenue
Narberth, PA 19072
(215) 668-4620

Principal business:
- —remote computing services
- —on-line computer services company

Applications emphasis: engineering and scientific; data management and database management

President: Neil Kleeman
Director of marketing: Ben Marino
Date founded: 1981
Primary customers: engineering and scientific community; business community
Product line: provides remote computing services for the business and scientific/engineering community. The company offers near-supercomputer processing speeds (up to 60 million operations per second) while maintaining user accessibility through interactive access. SSI's services are available on an interactive or batch basis from terminals, personal computers, or in-house computers.

Technology Catalysts, Inc. (TCI)
6073 Arlington Boulevard
Falls Church, VA 22044
(703) 237-9600

Principal business:
- —database producer

Applications emphasis: technology; biomedical research information; chemistry related information

President: Richard L. DiCicco
Date founded: 1979
No. of employees: 20
Primary customers: companies involved in biomedical, chemical, and other high technology fields

Product line: provides licensing information services. These services include locating, evaluating, marketing, and pricing services in such technology areas as chemistry and the biomedical field. To support these services, TCI maintains six computer-readable databases on the following topics: technology available for license; small high technology firms; controlled-release technology; dispersed diagnostics; electronic chemicals; and technology opportunities in Japan.

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User Ratings of Time-sharing Services

USER RATINGS

Datapro has just completed its 1984 user ratings of the time-sharing industry and the services it offers. Although rumor had it a year or so ago that the time-sharing industry was on a down-hill trend, the industry seemed to take a good look at itself, various companies made some necessary changes, and according to the results of this survey, the industry is not only holding its own, but is on the up-trend with 40 percent of the present users planning to increase their use of time-sharing services. Whether the industry gains new, first-time users, however, remains to be seen.

This year's survey differs from past surveys in that Datapro has recognized the two separate segments of the on-line industry, the information retrieval segment and the time-sharing segment, and that each market should be highlighted in a separate user ratings report. This report features only the responses received from users of time-sharing services. The ***User Ratings of Information Retrieval Services*** report appeared in the July supplement of the Datapro Directory of On-line Services (see page OL60–100–101).

Mailing lists to perform this survey were obtained from *MIS Week, Online, Inc., Learned Information, Inc.,* and the *Information Industry Association (IIA),* with a total of 22,000 surveys being mailed. The first mailing was completed in early April; a second, duplicate mailing was generated two weeks later. The number of responses from the 22,000 surveyed totaled 3500 (15.9 percent), which was twice the amount received from last year's survey. Of this amount, 2177 responded to the information retrieval section of the survey form; 365 responded to the time-sharing section of the survey. These 365 responses have been used to provide the statistics in this report, and to rate 26 time-sharing service vendors. The remaining disqualified forms were retained and combined with the qualified forms to be used for Datapro's first-ever Grand Prize drawing, with the winner receiving a fully configured Radio Shack TRS–80 Model 100 Portable Computer.

User Profile

The first four questions of the survey provide a profile of the responding users.

1. How would you best classify your company/organization?

	Number	*Percent*
Accounting Firm	21	5.9
Engineering Firm	26	7.2
Financial Institution	9	2.5
General Business Company	46	12.8
Government Agency	16	4.5
Insurance Company	2	0.6
Manufacturing Company	18	5.0
Medical/Health Care	11	3.0
Petroleum/Mining Company	5	1.4
Utility	15	4.2
Other	190	52.9

The User Ratings of Time-sharing Services report contains statistical and evaluative information derived from the responses to Datapro's third annual on-line user ratings survey. The total number of responses received was 3500 (15.9 percent), with 2100 responding to the information retrieval section of the survey, and 365 responding to the time-sharing services section of the survey. This report provides user evaluations of time-sharing companies only.

Users rated their services based on system response time, system dependability, operating instructions and training, documentation, technical support, languages and compilers, applications programs, cost/performance ratio, ease of use, and overall satisfaction. Because the number of responses for each time-sharing service varied, a weighted average is given in each of these categories.

The industry as a whole is also evaluated using the same criteria as listed above.

The top six companies listed in the *Other* category include consulting companies with 65 responses; software companies with 29 responses; educational institutions with 24 responses; computer services companies with 22 responses; libraries with 20 responses; and publishing companies with 15 responses. It appears that no matter what the type of business, there is a definite need for time-sharing services.

2. How large is your company/organization in terms of annual revenue?

	Number	*Percent*
Under $5 million	121	34.0
$5-50 million	41	11.5
$50-100 million	24	6.7
$100-500 million	27	7.6
Over $500 million	107	30.1
Nonprofit organization	36	10.1

It remains true, as in last year's survey, that companies *under* the $5 million revenue figure are still the largest users of time-sharing services. This signifies that the smaller companies still have a real need for the processing power and services that time-sharing vendors offer, without committing to equipment costs, software costs, and added

▷

personnel costs. The second highest figure belongs to the *over* $500 million group, which again corresponds to last year's survey. Large companies within this revenue range mainly use time-sharing services to supplement the company's own computer resources.

3. What is your annual budget for using remote time-sharing services?

	Number	*Percent*
Under $1,000	44	12.8
$1,000-5,000	55	16.0
$5,000-10,000	41	11.9
$10,000-50,000	85	24.7
$50,000-100,000	40	11.6
Over $100,000	79	23.0

A lot of money is still being poured into the use of time-sharing services. The survey pointed out that nearly 25 percent of the users have a budget figure of between $10,000 and $50,000, and that 23 percent have a budget figure of over $100,000. Only 12.8 percent are budgeted below the $1,000 amount.

4. What is your near-term plan for using time-sharing services?

	Number	*Percent*
No change	137	38.0
Increasing use	145	40.2
Decreasing use	79	21.9

These figures reflect the fact that time-sharing is definitely not dead, and not only holding its own, but on the upswing. Only 21.9 percent are planning on decreasing their use of time-sharing services, while the balance of 79 percent are either planning on maintaining or increasing their present rate of use.

5. How long have you used this service?

	Number	*Percent*
Under 6 months	44	12.5
6 months-2 years	85	24.1
2-5 years	109	30.9
Over 5 years	115	32.6

These figures tend to agree with the responses to Questions 3 and 4, showing that time-sharing is still alive and well with over 60 percent of the respondees continuing to use time-sharing services after more than two years.

User Applications

Reflecting the different types of customers using time-sharing services, the applications accommodated by these services are also various in type. According to the survey responses, the following lists the major applications processed by users of time-sharing services:

	Number	*Percent*
Accounting	72	19.8
Banking and Finance	42	11.5
Electronic Mail	123	33.8
Engineering & Scientific	79	21.7
Graphics	61	16.8
Insurance	9	2.5
Management Sciences	47	13.0
Data and Database Mgmt.	165	45.3
Manufacturing	17	4.7
Payroll and Personnel	30	8.2
Sales and Distribution	39	10.7
Other	93	25.6

The six most noted applications in the *Other* category included cataloging, software development, programming, education, financial planning, mailings, and word processing.

The primary uses of time-sharing services, according to the survey, are as follows:

	Number	*Percent*
Program development	74	20.7
Access service's applications programs	138	38.5
Execution of own programs	86	24.0
Backup or overload capacity	7	2.0

The top five other primary uses include electronic mail, communications, database production, cataloging, and information delivery.

Hardware/Access Methods

Terminals and microcomputers, according to the survey, are the two most popular hardware devices used in time-sharing environments. To no surprise, the IBM PC family and the Apple family dominated the total number of responses.

The survey also revealed that the primary access methods used by the survey are dial-up (228 responses, 63.9 percent), leased lines (78 responses, 21.8 percent), and *Other* access methods (51 responses, 14.3 percent).

Of the packet switched networks used by the responding time-sharing customers, the following are the most popular (more than one answer was allowed for this question since most customers use more than one public network):

	Number	*Percent*
Telenet	286	36.4
Tymnet	244	31.0
Uninet	50	6.4
GEISCO	40	5.1
Infonet	18	2.3
Cybernet	17	2.2
Autonet	13	1.7
CompuServe Network	10	1.3

User Ratings of Time-sharing Services

Customer Costs

According to the survey results, the *average* total monthly bill incurred by the users of time-sharing services is as follows:

	Number	*Percent*
Under $1,000	144	44.0
$1,000-5,000	86	26.3
$5,000-10,000	34	10.4
Over $10,000	63	19.3

Average monthly equipment rental costs were shown by the survey to be as follows:

	Number	*Percent*
Under $500	121	39.4
$500-2,000	49	16.0
$2,000-5,000	21	6.8
Over $5,000	45	14.7
None/vendor pays all charges	71	23.1

Comparison Columns

A total of 26 time-sharing vendors have been rated by their users in this survey. A minimum of three responses validated a vendor to be listed in the comparison columns shown at the end of this report. A weighted average system was used based on 4.0 being Excellent, 3.0 being Good, 2.0 for Fair, and 1.0 for Poor. Categories used to evaluate each vendor include the following:

- System response time
- System dependability (up-time)
- Operating instructions & training
- Documentation
- Technical support
- Languages and compilers
- Application programs
- Cost/performance ratio
- Ease of use
- Overall satisfaction

Additional information on most of the services rated in the comparison columns of this report can be found in the OL20 section and/or the OL30 section of The Datapro Directory of On-line Services. The information in the comparison columns, when combined with the additional information in the OL20 and OL30 sections, can be useful when evaluating time-sharing companies, and deciding which time-sharing company is best for you.

Industry Ratings

According to the survey responses, users are generally pleased with the services offered by time-sharing companies. The industry received a weighted average of 3.06 for overall satisfaction (4.0 for Excellent, 3.0 for Good, etc.), which portrays that the services the industry provides are more than acceptable, but could still be improved upon. System dependability showed the highest weighted average of 3.32, and languages and compilers came in as a close runner-up with a weighted average of 3.17. It appears the area most lacking is the documentation area with a low of 2.83. This follows through with what seems to be true with most of the computer-related industry, documentation is a problem. The overall evaluation of the time-sharing industry, according to the results of the survey, is as follows:

Response Time	*Number*	*Percent*
Excellent	108	30.4
Good	200	56.3
Fair	40	11.3
Poor	7	2.0

Weighted Average = 3.67

System Dependability (up-time)	*Number*	*Percent*
Excellent	155	43.5
Good	168	47.2
Fair	26	7.3
Poor	7	2.0

Weighted Average = 3.83

Operating Instruction & Training	*Number*	*Percent*
Excellent	82	23.4
Good	153	43.7
Fair	98	28.0
Poor	17	4.9

Weighted Average = 2.86

Documentation	*Number*	*Percent*
Excellent	79	22.6
Good	149	42.6
Fair	104	29.7
Poor	18	5.1

Weighted Average = 3.17

Technical Support	*Number*	*Percent*
Excellent	107	31.3
Good	151	44.2
Fair	67	19.6
Poor	17	5.0

Weighted Average = 3.02

Languages & Compilers	*Number*	*Percent*
Excellent	86	30.8
Good	159	57.0
Fair	29	10.4
Poor	5	1.8

Weighted Average = 3.17

▷

User Ratings of Time-sharing Services

Application Programs	***Number***	***Percent***
Excellent	76	26.6
Good	162	56.6
Fair	42	14.7
Poor	6	2.1

Weighted Average = 3.08

Cost/Performance Ratio	***Number***	***Percent***
Excellent	77	23.5
Good	156	47.7
Fair	78	23.9
Poor	16	4.9

Weighted Average = 2.90

Ease of Use	***Number***	***Percent***
Excellent	88	25.4
Good	185	53.5
Fair	63	18.2
Poor	10	2.9

Weighted Average = 3.01

Overall Satisfaction	***Number***	***Percent***
Excellent	81	23.0
Good	217	61.6
Fair	49	13.9
Poor	5	1.4

Weighted Average = 3.06

The Weighted Average is based on a scale of 4.0 for Excellent, 3.0 for Good, 2.0 for Fair, and 1.0 for Poor.

Conclusion

Datapro would like to thank the users for responding to the remote computing service survey. Datapro will continue to monitor the industry as a whole, and will also continue to publish factual reports relating to each individual vendor. ☐

User Ratings of Time-sharing Services

Time-Sharing Service	ADP Network Services	Automatic Data Processing, Inc. (ADP)	Battelle Memorial Institute	Boeing Computer Services Co.
No. of responses	3	12	4	14
Average length of use	6 months to 2 years	4 years	2 years	2 years
Primary use of service	execution of own progr.	access T/S applications	access T/S applications	program development
Applications most used	electronic mail, data and database management	accounting, data and database management, payroll	data and database management	engineering, data and database management, accounting
Primary access method	dial-up	dial-up	dial-up	dial-up
Network most used	Autonet, Telenet	Autonet, Telenet	Tymnet	Telenet
Average monthly user bill	$5,000-10,000	$5,000	$1,000-5,000	$1,000-5,000
Average monthly equipment rental cost	$500-2,000	$2,000	under $500	$500-2,000
USER RATINGS				
System response time				
Excellent	0	3	1	2
Good	3	7	3	8
Fair	0	1	0	3
Poor	0	0	0	0
Weighted average*	3.0	3.18	3.25	2.92
System dependability (up-time)				
Excellent	1	2	1	0
Good	2	9	3	11
Fair	0	0	0	3
Poor	0	0	0	0
Weighted average*	3.33	3.18	3.25	2.79
Operating instructions & training				
Excellent	1	3	0	0
Good	1	4	3	7
Fair	1	4	1	4
Poor	0	0	0	1
Weighted average*	3.0	2.91	2.75	2.5
Documentation				
Excellent	0	3	1	1
Good	1	4	1	9
Fair	1	4	2	3
Poor	0	0	0	1
Weighted average*	2.5	2.91	2.75	2.71
Technical support				
Excellent	1	3	2	2
Good	2	3	2	7
Fair	0	5	0	3
Poor	0	0	0	1
Weighted average*	3.33	2.82	3.5	2.77
Languages and compilers				
Excellent	0	1	0	4
Good	1	7	4	8
Fair	1	1	0	1
Poor	0	0	0	0
Weighted average*	2.5	3.0	3.0	3.23
Applications programs				
Excellent	1	1	0	0
Good	2	5	3	8
Fair	0	2	1	1
Poor	0	0	0	0
Weighted average*	3.33	2.88	2.75	2.89
Cost/performance ratio				
Excellent	0	2	0	0
Good	1	6	2	5
Fair	1	1	2	5
Poor	0	1	0	1
Weighted average*	2.5	2.9	2.5	2.36
Ease of use				
Excellent	0	3	0	1
Good	2	5	3	4
Fair	1	2	0	7
Poor	0	0	0	1
Weighted average*	2.67	3.1	3.0	2.38
Overall satisfaction				
Excellent	0	2	0	0
Good	3	8	3	10
Fair	0	0	0	4
Poor	0	0	0	0
Weighted average*	3.0	3.2	3.0	2.71

User Ratings of Time-sharing Services

Time-Sharing Service	CompuServe Inc.	Computer Research Co. (CRC)	Computer Sciences Corp.	Comshare, Inc.
No. of responses	17	4	12	9
Average length of use	2 years	2-5 years	5 years	5 years
Primary use of service	access T/S applications	program development	execution of own progr.	execution of own progr.
Applications most used	electronic mail, data and database management, engineering	accounting, data and database management	data and database management, electronic mail, accounting	payroll, data and database management
Primary access method	dial-up	leased lines	dial-up	dial-up
Network most used	Telenet, Tymnet	-	Infonet, Telenet	Telenet
Average monthly user bill	under $1,000	$5,000-10,000	$10,000	$1,000-5,000
Average monthly equipment rental cost	$500	$2,000-5,000	$500	$500
USER RATINGS				
System response time				
Excellent	3	1	5	0
Good	12	1	4	6
Fair	2	2	1	1
Poor	0	0	2	0
Weighted average*	3.06	2.75	3.0	2.86
System dependability (up-time)				
Excellent	7	1	6	1
Good	10	3	3	6
Fair	0	0	3	0
Poor	0	0	0	0
Weighted average*	3.41	3.25	3.25	3.14
Operating instructions & training				
Excellent	4	0	3	0
Good	9	2	5	5
Fair	2	2	2	2
Poor	2	0	2	0
Weighted average*	2.88	2.5	2.75	2.71
Documentation				
Excellent	4	0	5	0
Good	6	3	3	4
Fair	5	1	4	3
Poor	2	0	0	0
Weighted average*	2.71	2.75	3.08	2.57
Technical support				
Excellent	0	0	4	0
Good	12	2	6	4
Fair	3	2	2	1
Poor	1	0	0	0
Weighted average*	2.69	2.5	3.17	2.8
Languages and compilers				
Excellent	1	1	4	0
Good	11	3	6	4
Fair	4	0	0	0
Poor	0	0	0	0
Weighted average*	2.81	3.25	3.40	3.0
Applications programs				
Excellent	2	0	4	0
Good	11	2	7	5
Fair	2	1	0	0
Poor	0	0	0	0
Weighted average*	3.0	2.67	3.36	3.0
Cost/performance ratio				
Excellent	1	0	3	0
Good	9	3	3	5
Fair	5	1	2	1
Poor	1	0	2	0
Weighted average*	2.63	2.75	2.70	2.83
Ease of use				
Excellent	5	0	4	0
Good	7	3	4	7
Fair	4	1	4	0
Poor	1	0	0	0
Weighted average*	2.94	2.75	3.0	3.0
Overall satisfaction				
Excellent	3	0	4	0
Good	12	4	5	8
Fair	1	0	3	0
Poor	1	0	0	0
Weighted average*	3.0	3.0	3.08	3.0

User Ratings of Time-sharing Services

Time-Sharing Service	Control Data Corp.	D&B Computing Services, Inc.	Data Resources, Inc. (DRI)	Electronic Data System Corp. (EDS)
No. of responses	31	8	10	3
Average length of use	over 5 years	2-5 years	2-5 years	2-5 years
Primary use of service	access T/S applications	execution of own progr.	access T/S applications	access T/S applications
Applications most used	engineering, data and database management, graphics	data and database management, accounting, electronic mail	management sciences, data and database management	accounting, banking and finance, payroll
Primary access method	dial-up	dial-up	dial-up	dial-up
Network most used	Cybernet, Telenet	Dunsnet, Telenet	Tymnet, Telenet	Wats line
Average monthly user bill	$1,000	$1,000-5,000	$1,000	$1,000-5,000
Average monthly equipment rental cost	$500	$500	under $500	over $5,000
USER RATINGS				
System response time				
Excellent	8	3	5	1
Good	19	5	4	2
Fair	4	0	1	0
Poor	0	0	0	0
Weighted average*	3.13	3.38	3.40	3.33
System dependability (up-time)				
Excellent	13	4	4	1
Good	15	4	6	2
Fair	2	0	0	0
Poor	1	0	0	0
Weighted average*	3.29	3.50	3.40	3.33
Operating instructions & training				
Excellent	8	3	1	1
Good	8	2	4	1
Fair	14	3	4	1
Poor	1	0	1	0
Weighted average*	2.74	3.0	2.50	3.0
Documentation				
Excellent	8	2	0	1
Good	11	4	6	1
Fair	10	2	3	1
Poor	2	0	1	0
Weighted average*	2.81	3.0	2.50	3.0
Technical support				
Excellent	12	4	2	2
Good	9	3	7	0
Fair	9	1	1	1
Poor	1	0	0	0
Weighted average*	3.03	3.38	3.10	3.33
Languages and compilers				
Excellent	7	4	3	1
Good	16	3	4	2
Fair	3	0	2	0
Poor	0	0	0	0
Weighted average*	3.15	3.57	3.11	3.33
Applications programs				
Excellent	6	3	3	2
Good	16	4	6	1
Fair	4	0	0	0
Poor	0	0	0	0
Weighted average*	3.08	3.43	3.33	3.67
Cost/performance ratio				
Excellent	5	2	1	1
Good	15	4	7	1
Fair	11	2	1	1
Poor	0	0	1	0
Weighted average*	2.81	3.0	2.80	3.0
Ease of use				
Excellent	4	3	0	1
Good	16	5	7	1
Fair	8	0	2	1
Poor	1	0	1	0
Weighted average*	2.79	3.38	2.60	3.0
Overall satisfaction				
Excellent	6	3	1	1
Good	18	4	6	1
Fair	6	1	3	1
Poor	0	0	0	0
Weighted average*	3.0	3.25	2.80	3.0

User Ratings of Time-sharing Services

Time-Sharing Service	General Electric Information Services Co. (GEISCO)	GTE Telenet	IBM Information Network (IBM/IN)	ITT Dialcom, Inc.
No. of responses	37	8	6	15
Average length of use	over 5 years	2-5 years	2-5 years	2 years
Primary use of service	execution of own progr.	access T/S applications	access T/S applications	access T/S applications
Applications most used	management sciences, data amd database management, accounting	electronic mail, data and database management	electronic mail, data and database management, management sciences	electronic mail, data and database management, management sciences
Primary access method	dial-up	dial-up	dial-up	dial-up
Network most used	GEISCO Mark III, Telenet	Telenet	Telenet, IBM/IN	Telenet, Tymnet
Average monthly user bill	$5,000-10,000	$1,000	$1,000	$1,000
Average monthly equipment rental cost	$500-2,000	$500-2,000	$500	under $500
USER RATINGS				
System response time				
Excellent	19	2	5	5
Good	15	5	0	9
Fair	2	1	1	1
Poor	0	0	0	0
Weighted average*	3.47	3.13	3.67	3.27
System dependability (up-time)				
Excellent	26	4	5	7
Good	9	0	0	8
Fair	1	3	0	0
Poor	0	1	1	0
Weighted average*	3.69	3.25	3.50	3.47
Operating instructions & training				
Excellent	10	2	5	1
Good	18	3	1	6
Fair	7	2	0	5
Poor	0	1	0	2
Weighted average*	3.09	2.75	3.83	2.43
Documentation				
Excellent	6	1	5	1
Good	20	3	0	8
Fair	9	2	1	6
Poor	0	1	0	0
Weighted average*	2.91	2.57	3.67	2.67
Technical support				
Excellent	11	1	5	3
Good	15	5	1	6
Fair	7	0	0	3
Poor	2	1	0	1
Weighted average*	3.0	2.86	3.83	2.85
Languages and compilers				
Excellent	13	1	4	2
Good	18	2	2	2
Fair	4	1	0	0
Poor	0	1	0	0
Weighted average*	3.26	2.60	3.67	2.85
Applications programs				
Excellent	10	0	4	2
Good	16	3	1	6
Fair	7	1	0	2
Poor	1	1	0	0
Weighted average*	3.03	2.40	3.80	3.0
Cost/performance ratio				
Excellent	5	0	4	4
Good	19	2	1	8
Fair	10	3	1	2
Poor	1	0	0	0
Weighted average*	2.80	2.40	3.50	3.14
Ease of use				
Excellent	11	1	5	2
Good	20	6	1	9
Fair	4	1	0	4
Poor	0	0	0	0
Weighted average*	3.20	3.0	3.83	2.87
Overall satisfaction				
Excellent	6	1	4	4
Good	25	6	2	8
Fair	3	1	0	3
Poor	1	0	0	0
Weighted average*	3.03	3.0	3.67	3.07

User Ratings of Time-sharing Services

Time-Sharing Service	Litton Mellonics Information Center	Martin Marietta Data Systems	McDonnell Douglas Automation Co. (McAuto)	McDonnell Douglas Communications Systems and Services, Inc., (MDCSS)
No. of responses	6	4	8	4
Average length of use	6 months-2 years	2-5 years	5 years	2-5 years
Primary use of service	access T/S applications	program development	access T/S applications	execution of own progr.
Applications most used	data and database management, accounting, engineering	accounting, engineering, data and database management, payroll	engineering, graphics, banking and finance	data and database management, graphics
Primary access method	dial-up	leased lines	dial-up	dial-up
Network most used	-	-	Tymnet, Telenet	Telenet
Average monthly user bill	$1,000-5,000	$1,000	$1,000	$5000
Average monthly equipment rental cost	$500-2,000	$500-2,000	$2,000	$500
USER RATINGS				
System response time				
Excellent	1	2	1	2
Good	4	2	6	2
Fair	1	0	0	0
Poor	0	0	0	0
Weighted average*	3.0	3.50	3.14	3.50
System dependability (up-time)				
Excellent	2	4	2	2
Good	4	0	5	2
Fair	0	0	0	0
Poor	0	0	0	0
Weighted average*	3.33	4.0	3.29	3.50
Operating instructions & training				
Excellent	0	0	2	0
Good	3	3	3	3
Fair	3	3	1	1
Poor	0	0	1	0
Weighted average*	2.50	2.50	2.86	2.75
Documentation				
Excellent	0	0	2	2
Good	3	1	3	2
Fair	3	3	1	0
Poor	0	0	1	0
Weighted average*	2.50	2.25	2.86	3.50
Technical support				
Excellent	1	1	1	1
Good	4	3	4	2
Fair	1	0	2	0
Poor	0	0	0	1
Weighted average*	3.0	3.25	2.86	2.75
Languages and compilers				
Excellent	3	3	2	1
Good	2	1	4	2
Fair	0	0	0	0
Poor	0	0	0	0
Weighted average*	3.60	3.75	3.33	3.33
Applications programs				
Excellent	0	1	1	1
Good	4	2	3	2
Fair	1	1	1	1
Poor	0	0	0	0
Weighted average*	2.80	3.0	3.0	3.0
Cost/performance ratio				
Excellent	2	0	1	1
Good	3	2	3	1
Fair	0	2	2	1
Poor	1	0	1	1
Weighted average*	3.0	2.50	2.57	2.50
Ease of use				
Excellent	1	1	1	1
Good	2	3	5	3
Fair	3	0	1	0
Poor	0	0	0	0
Weighted average*	2.67	3.25	3.0	3.25
Overall satisfaction				
Excellent	1	1	1	2
Good	3	3	5	0
Fair	2	0	1	2
Poor	0	0	0	0
Weighted average*	2.83	3.25	3.0	3.0

User Ratings of Time-sharing Services

Time-Sharing Service	Neshaminy Valley Information Processing, Inc. (NVIP)	OCLC Online Computer Library Center, Inc.	I.P. Sharp Associates Ltd.	Tymshare, Inc.
No. of responses	8	30	3	25
Average length of use	over 5 years	over 5 years	5 years	5 years
Primary use of service	execution of own progr.	access T/S applications	execution of own progr.	access T/S applications
Applications most used	data and database management, graphics, electronic mail	data and database management, electronic mail, accounting	electronic mail, data and database management, graphics	electronic mail, data and database management, management sciences
Primary access method	leased lines	leased lines	leased lines	dial-up
Network most used	Telenet, Tymnet	Tymnet, Telenet	-	Tymnet
Average monthly user bill	$5,000-10,000	$1,000	over $10,000	$1,000
Average monthly equipment rental cost	$5,000	$500	over $5,000	$500
USER RATINGS				
System response time				
Excellent	1	2	3	8
Good	4	19	0	14
Fair	1	8	0	3
Poor	2	0	0	0
Weighted average*	2.50	2.79	4.0	3.20
System dependability (up-time)				
Excellent	4	5	3	13
Good	4	16	0	11
Fair	0	8	0	1
Poor	0	1	0	0
Weighted average*	3.50	2.83	4.0	3.48
Operating instructions & training				
Excellent	0	13	0	6
Good	4	15	2	10
Fair	3	1	1	8
Poor	0	0	0	1
Weighted average*	2.57	3.41	2.67	2.84
Documentation				
Excellent	0	12	0	5
Good	4	14	1	10
Fair	3	3	1	8
Poor	0	0	0	1
Weighted average*	2.56	3.31	2.50	2.79
Technical support				
Excellent	0	10	1	9
Good	4	14	0	9
Fair	3	2	1	6
Poor	1	1	0	0
Weighted average*	2.25	3.22	3.0	3.13
Languages and compilers				
Excellent	3	3	1	4
Good	3	7	0	10
Fair	1	2	1	1
Poor	0	0	0	0
Weighted average*	3.29	3.08	3.0	3.20
Applications programs				
Excellent	1	3	1	3
Good	4	12	0	11
Fair	0	4	1	5
Poor	0	0	0	0
Weighted average*	3.20	2.95	3.0	2.89
Cost/performance ratio				
Excellent	3	4	0	11
Good	3	12	1	7
Fair	0	7	1	5
Poor	0	0	0	0
Weighted average*	3.50	2.87	2.50	3.26
Ease of use				
Excellent	2	6	1	11
Good	6	16	0	12
Fair	0	4	1	0
Poor	0	1	0	2
Weighted average*	3.25	3.0	3.0	3.28
Overall satisfaction				
Excellent	0	7	1	9
Good	8	18	1	14
Fair	0	4	0	2
Poor	0	0	0	0
Weighted average*	3.0	3.10	3.50	3.28

User Ratings of Time-sharing Services

Time-Sharing Service	UCCEL Corp.	United Information Services Division (UIS)		
No. of responses	5	6		
Average length of use	over 5 years	over 5 years		
Primary use of service	access T/S applications	execution of own progr.		
Applications most used	engineering, data and database management	data and database management, electronic mail, engineering		
Primary access method	dial-up	dial-up		
Network most used	Telenet, Tymnet, AT&T	Uninet		
Average monthly user bill	$1,000-5,000	over $10,000		
Average monthly equipment rental cost	$500	$5,000		
USER RATINGS				
System response time				
Excellent	1	4		
Good	3	2		
Fair	0	0		
Poor	1	0		
Weighted average*	2.80	3.67		
System dependability (up-time)				
Excellent	1	5		
Good	3	1		
Fair	0	0		
Poor	1	0		
Weighted average*	2.80	3.83		
Operating instructions & training				
Excellent	0	2		
Good	3	3		
Fair	1	1		
Poor	1	0		
Weighted average*	2.40	3.17		
Documentation				
Excellent	0	2		
Good	3	3		
Fair	1	1		
Poor	1	0		
Weighted average*	2.40	3.17		
Technical support				
Excellent	1	2		
Good	2	3		
Fair	0	1		
Poor	2	0		
Weighted average*	2.40	3.17		
Languages and compilers				
Excellent	1	2		
Good	3	3		
Fair	0	1		
Poor	1	0		
Weighted average*	2.80	3.17		
Applications programs				
Excellent	0	3		
Good	3	2		
Fair	0	1		
Poor	1	0		
Weighted average*	2.50	3.33		
Cost/performance ratio				
Excellent	0	1		
Good	3	4		
Fair	1	0		
Poor	1	0		
Weighted average*	2.40	3.20		
Ease of use				
Excellent	0	2		
Good	3	4		
Fair	1	0		
Poor	1	0		
Weighted average*	2.40	3.33		
Overall satisfaction				
Excellent	0	1		
Good	3	5		
Fair	1	0		
Poor	1	0		
Weighted average*	2.40	3.17		

All About Electronic Mail

Electronic mail offers the ability to exchange textual and graphics information electronically, resulting in faster information exchange and turnaround. The field embraces a wide range of communications devices and technologies that include provisions for message sending and receiving along with the ability to access personal mailboxes. This report explores the various electronic mail technologies, communications devices such as communicating word processors and electronic typewriters, computer-based messaging systems, facsimile, and electronic copier/printers. It also provides guidelines for choosing among the different systems. Table listings detailing specifications for 61 computer-based messaging systems from 65 different vendors follow the comprehensive directory of suppliers.

While the needs of each individual business may vary, there is no doubt that positive advantages accrue by the implementation of an efficient electronic mail system. As an alternative to conventional mail delivery services, electronic mail has gained widespread attention, partially due to the growing population of terminal devices in the office as well as in the home. This accelerated interest will continue as vendors strive to provide easy-to-use systems and to support links among different systems and services.

The term *electronic mail* applies to many different technologies that allow for the electronic transmission of textual and graphics information. This ability is not only central to all electronic mail systems but is also becoming an increasingly important component of the integrated office as a whole. With the advent of the automated office, information is created and stored electronically. It therefore follows that the electronic manipulation of data must also include the ability to disseminate this information, along with pertinent commentary, in the quickest possible way. The technology, in its broadest sense, encompasses all types of electronic messaging, including facsimile transmissions, Telexes, Mailgrams, and voice. In recent years, however, electronic mail has increasingly been associated with text messages transmitted between users of networked computers.

The IBM Scanmaster 1 is designed to serve as a facsimile terminal, graphic, input scanner, and text printer. When the Scanmaster's host is equipped with IBM's Image Distribution System software, the unit functions as part of an electronic mail network.

Today's market supports a variety of electronic mail software, hardware, and services with a wide range of features. When planning to implement an electronic mail system, the volume of mail will help to determine the desired speed of communications and the capability of the system. Additionally, the location of those using the system will have to be included in the planning to determine whether gateways are needed to communicate over long distances. One other consideration includes the question of whether a text-only system is sufficient or whether a text and graphics capability is required. This report provides an overview of current market offerings along with information designed to assist the potential user in the evaluation of which electronic mail features may be needed, what equipment is available for input and output of messages, and what recent developments may mean to the future growth of electronic mail.

The move to interconnect systems became apparent over the past year, as a number of major vendors of electronic mail systems and services announced alliances linking various products. Digital Equipment Corporation and MCI Communications Corporation began a joint marketing effort promoting VAX Mailgate for MCI Mail. This new software product provides message exchange and access to users of Digital's All-IN-1 Integrated Office and Information System and to subscribers to MCI's worldwide public electronic mail service. An interface to Digital's Message Router software provides the store-and-forward capabilities. In other announcements, MCI Communications and CompuServe announced a joint agreement to interconnect their electronic mail networks, and Telenet's Telemail and Telecom Canada's Envoy 100 electronic messaging services announced an international hookup to link their respective subscribers. Soft-Switch, Incorporated, a vendor of office systems networking software, offers transparent software links that provide interchange among electronic mail systems from different vendors.

▷

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Delivery Method / Delivery Priority	PRIORITY 1 Immediate	PRIORITY 2 Same Day	PRIORITY 3 Next Day	PRIORITY 4 2 to 4 Days	PRIORITY 5 7 or More Days
Telephone Conversation*	If you're lucky to catch the person	Yes	If needed	—	—
Western Union Telegram	For a premium price	For a premium price	Overnight delivery at reduced rate	— —	— —
Western Union Mailgram	No	No	Yes	—	—
Local Courier	Within an hour, but very expensive	Yes, but very expensive	Yes	—	—
Nationwide Courier	No	No	Yes	Yes	—
USPS Express Mail	No	No	Yes	—	—
USPS 1st Class Mail	No	No	No	Usually	Occasionally
USPS Overseas Air Mail	No	No	No	No	Yes
USPS Overseas Surface Mail	No	No	No	No	Plan on 2 to 3 weeks average
Intra-Office Mail	Do it yourself	Usually	Yes	Perhaps, in a large company	You'd be surprised how many
Inter-Office Mail	Using phone, telegram or courier	Using phone, telegram or courier	Using Express Mail, WU or courier	Using 1st Class	Using USPS services

** Telephones are included here, even though they technically are classified as electronic devices.*

Figure 1. Information priorities and conventional delivery methods

Despite these moves to extend the reach of electronic mail, it will be years before users of any electronic mail system will have access to all other electronic mail users; however, through the move to adopt universal electronic mail standards and the cooperation slowly evolving among vendors, the industry is moving in a positive direction.

WHAT IS ELECTRONIC MAIL?

Taking into consideration its most fundamental characteristics, electronic mail can be defined as an electronic means for communicating textual and graphic information. While that definition is admittedly wide ranging, it can be further qualified by addressing the *mail* and *message* aspects of the concept. First, we are talking about information that is *intended for distribution* to other people. Information that is deliverable by electronic mail is generally information that can also be sent by other conventional means. This could be any of the following:

- Material that could also be sent through the U.S. Postal Service (first class mail, overseas mail, etc.).
- Something that one might also send through a special courier service (i.e., Federal Express, Purolator, etc.).
- Inter- or intracompany mail.
- A voice message that could be delivered over the telephone.

The common denominator for all of these examples is a *time factor.* The priority of a message will first determine how much time there is to deliver it, and this, in turn, will suggest the only possible methods for getting the material to its location on time when using conventional services. Figure 1 depicts the use of conventional, nonelectronic delivery methods as they relate to different priorities. The most notable feature of this table is that there are few services available for the *Immediate* or *Same-day* delivery of messages and documents. Those services that do handle deliveries with some degree of urgency (using the telephone or sending a telegram, for example) are not really oriented toward the delivery of hard copy letters and documents. That's where the use of electronic mail can be significantly faster.

THE ADVANTAGES OF ELECTRONIC MAIL

In comparing electronic mail methods to conventional mail/distribution methods, a number of advantages are

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All About Electronic Mail

obvious. Chief among these, as mentioned already, is the speed of delivery. Fast delivery of messages generally implies faster turnaround time for replies, and in many organizations, the primary application for electronic mail is priority messaging and scheduling. Electronic mail does, of course, have further advantages over conventional distribution methods. The best way to describe these is by listing the other disadvantages of the conventional services shown in Figure 1.

Telephones—To be fair, the voice telephone network should not be compared to text-based electronic mail systems. Whereas the typical electronic mail system is meant to handle text messages of any length, the voice telephone can only handle brief messages. Even in this limited application, though, the telephone is but a poor substitute for electronic mail. Consider the following:

- An internal Datapro study revealed that it takes about three attempts to place one phone call. That means that only about one third of the calls that are attempted get through on the first try. This makes the telephone very unreliable as a means for delivering high-priority messages.

- A telephone conversation is not concrete enough to consummate many business transactions. It lacks hard copy, which makes it impossible to document verbal agreements. Because of this, the telephone is not usually viewed as a priority medium for finalizing formal arrangements and business transactions.

- Voice communications content is much less compact than text communications. Even if you wanted to read a 10-page document over the phone for someone to copy by hand, it would take you much longer than sending it through some form of electronic mail or even a courier service. It would probably cost more as well.

- Because the telephone does not produce hard copy records, follow-up work is often necessary to document and distribute information relayed by voice over the phone. This follow-up may be as simple as making a few notes, or it may be as involved as dictating a formal message and having it typed and distributed to the interested parties.

The sad part of all this is that the public telephone network has more omnipresence in the market (and world) than any new, private electronic mail network can ever hope to achieve; that is, of course, unless an electronic mail service makes use of the public telephone lines as well.

The Postal Service—The initial motivation for developing electronic mail sprang from a general dissatisfaction with the performance of the U.S. Postal Service. A military branch of the U.S. government developed the first large-scale computer-based electronic mail system, Arpanet, in 1972. Since then, many firms in the private sector have engaged in the electronic mail business, and the postal service continues to be hammered by its critics for being both too expensive to use and too incompetent to provide consistent service. This criticism might be well deserved when considering the delivery of normal mail, but to criticize the U.S.P.S. for not providing instantaneous delivery of goods is missing the mark. The U.S.P.S. is designed to handle mail of low priority by today's standards. In this age of electronics we have vastly stepped up our expectations when it comes to information dissemination. Electronic mail is popular because it satisfies this emerging need for the instant delivery of information.

Western Union—Today, the Western Union Telegram is all but a nostalgic thing of the past. It has been supplanted by the Western Union Mailgram, a message that can be ordered over the telephone or computer terminal, but which is delivered the next day by a letter carrier from the post office. Telegrams and Mailgrams have limited message content, and they do not compare very favorably with electronic mail either in the cost-per-message or the flexibility of the content. Mailgrams have also become a popular medium for the widespread delivery of marketing and sales literature, invitations, and company announcements.

Courier Services—Local, regional, and national couriers are often used to transport packages of information that need to be delivered overnight. A combination of airplanes and trucks is usually employed for the swift deployment of packages from city to city. While these services have proven to be reliable and swift by conventional standards, they are costly and cannot usually provide anything better than overnight delivery in most city-to-city situations. For companies that are heavily engaged in the regular use of couriers, electronic mail can usually cost justify itself by the elimination of the courier costs. Even so, when electronic mail isn't possible between two points, services like Federal Express, Purolator, or the U.S.P.S. Express Mail service can be effective delivery tools.

Inter-company Mail—The delivery of messages and documents within one's own organization can sometimes be the most aggravating bottleneck of all. We've all heard stories about how it literally takes days for interoffice mail to circulate in some large companies. Once it gets there, there's no guarantee the recipient will immediately look at it. Internal electronic mail systems seek to eliminate this problem by sending messages instantly, and by notifying the recipient that a message has arrived.

In summary, the chief advantages of electronic mail are as follows:

- Speed of delivery.

- Faster message/reply turnaround time.

- Guarantee of delivery on first try, or on an automatic store-and-forward basis until the message is delivered.

- The creation of an audit trail of message transactions as well as hard copy message delivery.

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- More cost-effective and efficient when compared to the high-volume use of special couriers or even interoffice mail.

This list of advantages does not apply in equal measure to every form of electronic mail—or to every application that you may encounter—but you may use it as a general checklist when evaluating your needs.

COST JUSTIFICATION

The subject of cost justifying electronic mail is controversial. In some special—and perhaps rare—cases, one can cost justify electronic mail because it replaces current equipment, personnel, or outside services needed to handle information distribution. In reality, though, the addition of electronic mail usually implies added equipment and expense. The ability to save time through the use of electronic mail is centrally important to its justification in an organization. As we examine the applications of electronic mail systems, we will see the far-reaching effects these systems may have on overall operations in a company.

THE ELECTRONIC MAIL PROCESS

In practice, the sending of an electronic mail message involves three fundamental steps; the *input* of the information, the *transfer* of the message electronically, and the *output* of the information at the recipient's site. The ways in which these three basic steps are carried out vary greatly from one form of electronic mail system to another. Figure 2 illustrates the wide variety of input, transfer, and output technologies available to today's user.

In an ideal electronic mail environment, one should be able to take any Input method shown in Figure 2, use any of the various Transfer methods, and have the result delivered using any of the Output techniques offered. While the reality of today's technology does not yet allow this direct interface of many dissimilar forms of information handling, the day is certainly coming when a computer-controlled network may actually assist the user in selecting the most efficient means of sending an electronic message, choosing from a vast menu of possibilities not unlike those designated in Figure 3. For now, one must settle for the types of equipment that are available, and even in these cases, the efficiency of sending messages and mail electronically can be much greater than through conventional distribution channels.

ELECTRONIC MAIL FUNCTIONS AND APPLICATIONS

If we confine ourselves to the definition of electronic mail offered at the beginning of this report, we are talking about functions that are mainly concerned with the transmittal or communications of electronic text and graphic information. The most elementary way of analyzing these functions and your needs is by categorizing them according to the Who, What, When, Where, and Why of operations. Only after considering all of these aspects of your information distribution needs can you truly understand their actual function in your organization and your possible use of electronic mail.

Who—The first matter to consider is the question of who will be sending and receiving messages. There are two primary choices: *from person to person* (point-to-point) or *from one person to a group of persons* (distributed). A group

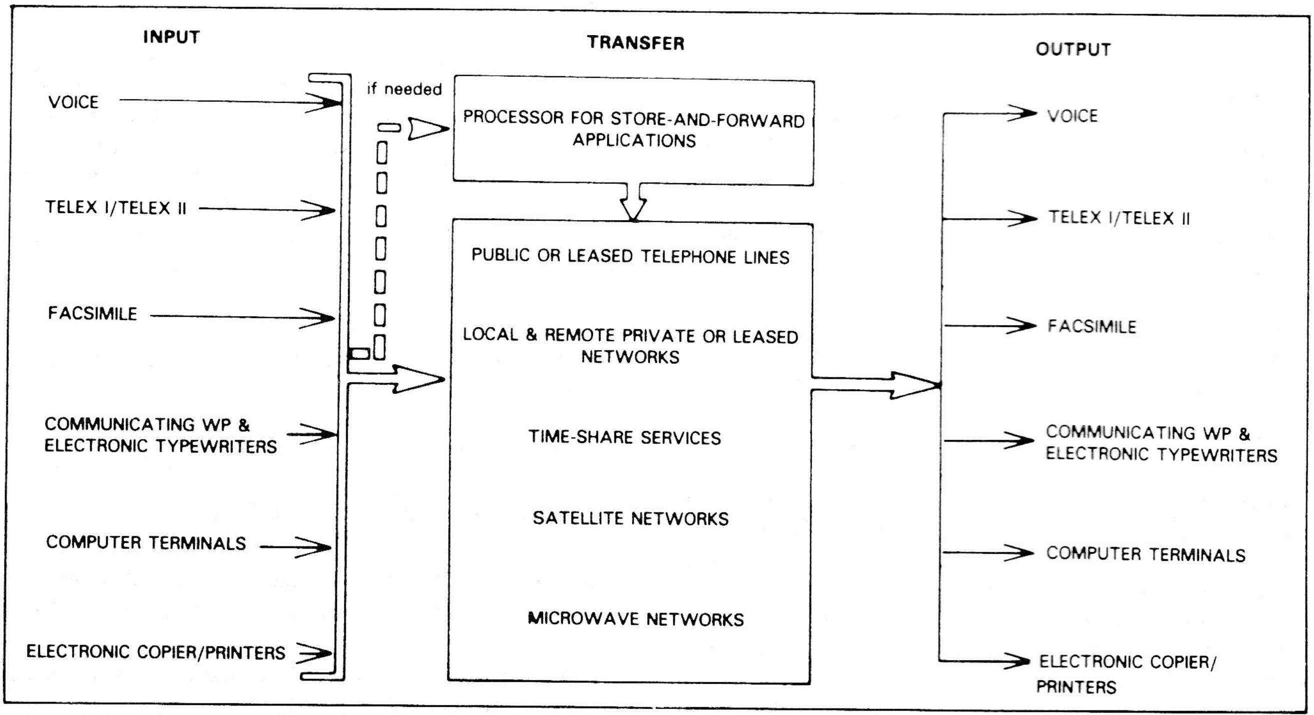
INPUT
VOICE
TELEX I/TELEX II
FACSIMILE
COMMUNICATING WP & ELECTRONIC TYPEWRITERS
COMPUTER TERMINALS
ELECTRONIC COPIER/PRINTERS
if needed
TRANSFER
PROCESSOR FOR STORE-AND-FORWARD APPLICATIONS
PUBLIC OR LEASED TELEPHONE LINES
LOCAL & REMOTE PRIVATE OR LEASED NETWORKS
TIME-SHARE SERVICES
SATELLITE NETWORKS
MICROWAVE NETWORKS
OUTPUT
VOICE
TELEX I/TELEX II
FACSIMILE
COMMUNICATING WP & ELECTRONIC TYPEWRITERS
COMPUTER TERMINALS
ELECTRONIC COPIER/PRINTERS

Figure 2. The input, transfer and output technologies of electronic mail systems

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would be any list of two or more people that can be programmed to automatically receive a message electronically. This group could be an organizational group—such as all sales managers or all supervisors—or it could be a personally selected group chosen by the individual sending the message.

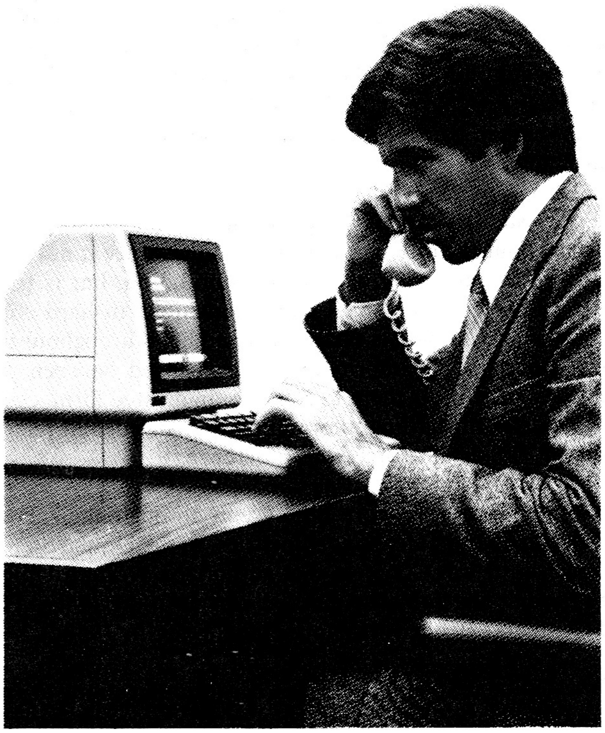
What—Information for electronic mail transmittal falls into three basic types:

- Messages, memos, and reminders not intended for general distribution. These generally transpire on a one-to-one basis.
- Administrative messages, memos, policies, and reminders, usually directed to a group of individuals within a company.
- Longer text projects such as documents, reports, and manuals, sometimes sent as "attachments" to a cover memo or message.

Where—Electronic mail can exist internally, or it can be linked to outside parties. The question of "Where," then, is related to the proximity of the recipient(s) of the message. One can usually think of the recipient as being *internal* (on-site) or *external* (at another site). One might also have a situation in which there is more than one electronic mail network within the same organization. The question of "Where" in this case becomes a matter of sending within one's own network or to an outside network.

When—As stated earlier, the priority of an electronic mail message is one of the key reasons for its existence. Every message that is created is done so with the thought of distribution in mind. Time priorities can generally be thought of in one of two ways. There is a need to send material *immediately*, and there are opportunities when a message can be *stored and forwarded for later delivery*. The relative speed or store-and-forward capability of a system will depend on its particular technology.

Why—The question of "Why" electronic mail is used is at the very heart of its purpose and presence in an organization. Indeed, most companies know why they want to use it before they know how they are going to implement it, and this harkens back to the fact that the need for electronic mail always precedes the means or methods for implementing it. Of course, the question of "Why" can be answered from the standpoint of advantages or cost-effectiveness, and these subjects are covered in other sections of this report. In terms of pure function, however, the very immediacy and efficiency of electronic messaging may be attractive enough to justify its use. It can literally be applied to any one of the infinite forms of text and graphic information in order to more effectively distribute important messages, documents, reminders, suggestions, and ideas.



Hewlett-Packard's HP Desk Manager is a software package that runs on the HP 3000 computer system also from Hewlett-Packard. Shown above is an HP 3000-compatible terminal.

There is also a natural tendency to extend an understanding of electronic mail into the *pre-* and *post*-transmission processes of *document creation* and *usage*. This entails an understanding of the methods used to prepare information prior to its input for transmission, as well as some knowledge of its usage once delivered. An analysis of these processes must include such considerations as the word processing features of a text editor, the list processing capabilities of a computer, the electronic filing capabilities of a storage device, or any number of operations that are peripheral to the actual electronic mail process. When examining the greater applications needed for electronic distribution, then, one must consider the communications stage as but one functional part of the overall applications picture.

THE TECHNOLOGY OF ELECTRONIC MAIL

As shown in Figure 2, the technologies that are associated with electronic mail are many and varied. This section of the report will provide an overview of the key electronic mail technologies and will outline their general usage and functionality in this context.

TELEX I AND TELEX II

Under the auspices of Western Union, Telex I (formerly Telex) and Telex II (formerly known as TWX) message services are widely used for the regular transmission of messages over communications lines. Using keyboard entry for the generation of text messages, these are perhaps the oldest keyboard-oriented services that have been made available to the general business user.

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All About Electronic Mail

▷ The domestic Telex I message system, owned and operated by Western Union in the United States, had its origins in Germany in the 1930s. In the ensuing decades, it spread throughout Europe and the world. Today the international message system includes 200,000 U.S. subscribers, 90,000 elsewhere in North America, and an additional 1.7 million around the world.

The system is held in high regard by business people throughout the international community, since it not only features a hard copy of printed information, but is truly capable of conversational communications in hard copy form. A circuit path is established and held throughout the call period while information is exchanged between the parties, permitting them to converse in printed form, clarifying details regarding information exchanged, and retaining all the details for further reference.

Most countries support the system through their Post, Telegraph, and Telephone ministries. In the United States, however, it was Congress that authorized Western Union to become the domestic message carrier in the 1940s. The FCC then extended that to include Telex in 1958.

International Telex I and Telex II communications to and from the United States have been handled through international record carriers (IRCs) including RCA Global Communications, ITT World Communications, Western Union International (not affiliated with Western Union Telegraph Company), TRT Telecommunications, and FTC Communications. Foreign destinations may be served by more than one of these carriers.

In 1982, the Telex carriers gained FCC permission to expand their territories. Western Union, which was previously restricted to the U.S., is now offering international Telex service. The IRCs were formerly limited to International Telex, but, as of March 1982, provide all Telex services in the United States as well.

The Teletypewriter Exchange Service (TWX) was formerly owned and operated by AT&T; under AT&T, TWX was a competitor of Western Union's Telex network. The two networks were originally incompatible, but Western Union, after it acquired TWX in the 1970s, connected Telex and TWX subscribers through a system of computer store-and-forward switching systems that resolves code and speed conversions automatically. In 1980, realtime communications were added, allowing customers the option of choosing either system. TWX has been renamed Telex II, and the message network extends through North America, serving the United States and Canada.

A message store-and-forward computer switching system is used in conjunction with Telex I and Telex II to provide a service called EasyLink. Through EasyLink, a subscriber may transmit a message to another subscriber destination even though the terminal at the destination is busy, obviating the need to redial until a successful connection can be established. Since the store-and-forward system serves both Telex I and Telex II subscribers, it permits message transfer between the two networks. Any necessary code conversion is automatically performed through the system, but a higher rate applies to either Telex I-to-Telex II or Telex II-to-Telex I terminal communications. There is a minimum call length of one minute for all calls except straight Telex I-to-Telex I calls.

EasyLink permits either single- or multiaddress messages to be sent with a limit of 250 multiaddress messages per "broadcast." Important announcements or critical information changes can thus be expedited to all concerned parties.

Additional services offered by Western Union are the Cablegram, Mailgram, Computer Letter, and Information Retrieval Services.

When using the Telex I or Telex II network, one is charged in three different ways. The first charge is a network access charge; the second charge is a measured usage charge, which basically means that one is charged for the amount of time spent on the network. The third category of charges relates to the actual rental of the terminal being used and the added cost of any optional features. The terminals themselves come in various degrees of sophistication, so the cost differs accordingly. In addition, charges for services like EasyLink vary widely depending on the type of interface being done (i.e., Telex I-to-Telex I, Telex I-to-Telex II, Telex II-to-Telex I, etc.).

The advantages of using Telex I or Telex II for electronic mail are as follows:

- Relatively low cost.
- Domestic and international service.
- Telex I and Telex II are in widespread use throughout the world.
- Immediate or store-and-forward delivery.

The disadvantages of Telex I and Telex II are also worth considering, however:

- The service is somewhat slow when compared to computer-based messaging.
- Copy output quality is not very high on some older terminal models, making their usage strictly utilitarian and not geared towards general office distribution which requires higher quality.
- The systems are meant for brief message exchanges, not lengthy documents and reports. That is because the transmission rate is slow and the usage charges high, which results in expensive transmissions when they run longer than a few minutes.

Although Telex I and Telex II are not ideal for long text transmissions, these services have supported the international business community very well for the fast delivery of short messages. We can expect to see Telex I and Telex II ▷

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TECHNOLOGY	DELIVERY SPEED	MESSAGE OUTPUT FORM	STORE-AND-FORWARD CAPABILITY	MESSAGE PREPARATION REQUIRED
Telex I/Telex II	Immediate or same day	Hard Copy	Optional, perhaps through outside service	Keyboarding of message
Facsimile	Immediate or same day	Hard Copy	Optional, perhaps through outside service	None
Communicating WP & Electronic Typewriters	Immediate or same day	CRT Display or Hard Copy	Optional, if part of network	Keyboarding of material
Computer Network Terminals	Immediate or same day	CRT Display or Hard Copy	Through network processors	Keyboarding of material
Electronic Copier/Printers	Immediate or same day	Hard Copy	Standard	Keyboarding of material
Voice Mail	Immediate, same day or other day as needed	Voice message	Standard	Voice input

Figure 3. General characteristics of electronic mail technologies

continue to thrive until a viable and cost-effective replacement is in place on a worldwide basis. It should be noted, however, that communicating products such as electronic typewriters and word processors that are provided with Telex emulations make such usage easier.

COMPUTER-BASED ELECTRONIC MAIL SYSTEMS

The latest developments in electronic mail revolve around the use of computers to control the transmission of textual information. In coming years, the computer-based electronic mail system will be the most familiar type to the average end user. Developments have been made in this area that literally involve all forms and sizes of computers, from mainframes, to minis, to micros to word processors. The ultimate goal is a network where all the various computers can communicate with each other. The first concrete step in this direction is the recently announced National Bureau of Standards Specification of Message Format for Computer-Based Message Systems. Any systems adhering to this standard could theoretically hook up to each other and provide a means of message transfer between systems.

Computer-based electronic mail systems can be subdivided into three basic types:

- **Communicating Devices**, which transmit and receive information over communication lines.
- **Remote Computing Services**, which feature electronic mail applications.
- **In-house Systems** for electronic mail applications, which may employ special software to existing computers, or provide new processors and software to operate over an internal or private communications network.

In each of the three types of computer-based electronic mail systems, the functions performed take advantage of a computer's ability to assist in text input, manipulation, storage, and distribution as needed to other terminals in the network. Before going on to discuss each of the three forms of computer-based systems in more detail, it would be useful to summarize the general approach taken in all of these cases and to note the special advantages of using this form of electronic mail.

There are two general levels of activity that we can approach in order to discuss the general characteristics of computer-based electronic mail. The first is a kind of macro overview, looking at the overall structure of the entire system. Then, if we zoom in a little closer, we can examine the system from the individual user's point of view.

The overall structure of the entire computer-based electronic mail system will have the following general features:

- It will exist as a network with local and/or remote access to processors that will conduct the electronic mail functions.
- Terminals will be available to each user of the system, and these will be distributed as needed throughout the organization. Keyboard terminals will be the most common input device, although special tablets or touch-sensitive displays may also be employed for those users who do not work with keyboards.
- There will either be a central computer, communications processor, distributed special function computers or a combination of all of these to handle the processing of electronic mail traffic. The system may provide store-and-forward functions and will automatically manage the traffic or text over the communication lines. This may or

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may not be done in combination with the flow of data communications over the same lines. The system may or may not access a common database of information and files that may also be accessed through the electronic mail system.

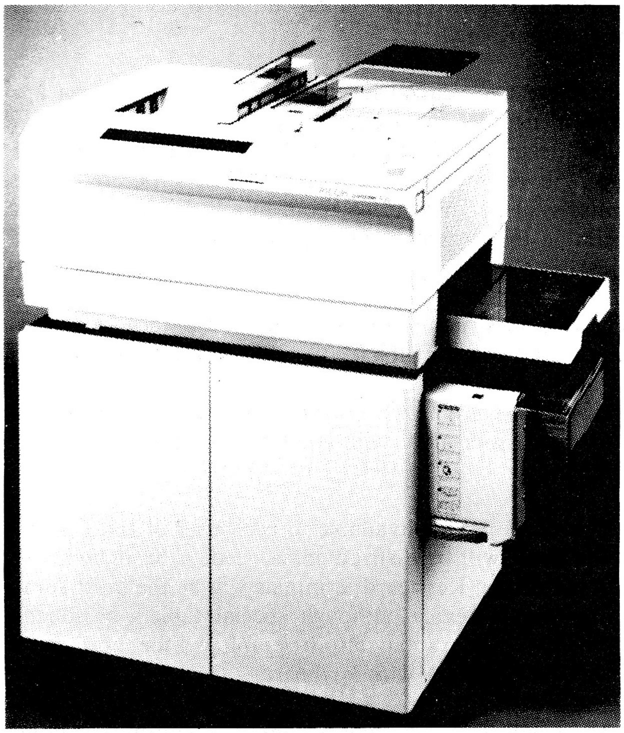
If we now come down to the level of the individual user of the system, we can examine the normal features that one could encounter while using a system like this.

- Each user will have a personal terminal to use as an input device for the electronic mail network. This will generally be a keyboard that is also used for other purposes like word processing or data entry. Each terminal may be linked directly to the electronic mail processor, or clusters of workstations can be joined in order to share a common link. In any case, the connection itself will probably be invisible to the user who won't necessarily need to understand the details so long as he/she can access the system anytime.

- Each user will have a personalized electronic mail "address," phone number, or other designation for his/her terminal.

- Each user will have an electronic "mailbox" or file containing sections for incoming and outgoing messages.

- An on-line directory of user names and addresses will be available to assist in sending messages.



The Ricoh Rapicom 830 is a plain-paper, digital facsimile transceiver using laser printing technology. The unit can perform delayed or immediate broadcast to a maximum of 200 different locations. Further, the Rapicom 830 can instruct remote 830s equipped with SAF-PAK, to perform the actual operation to nearby locations at lower local line rates.

- It will be possible to send messages point to point or from one person to a designated group of recipients.

- The system will employ a menu approach for assisting the user in sending messages. The menu will be a display of user alternatives in sending messages and will prompt the operator through the necessary steps needed to send or access information on the system.

- The ability to perform text editing tasks can be handled in two basic ways: 1) word processing features might be resident in the sending terminal itself but not in the general electronic mail software for the network, or 2) the processors which provide electronic mail functions for the entire network might also contain text editing software features that can be accessed by all terminals on the network. In many cases, there may be a combination of these approaches employed, especially when some of the terminals on the system might actually be communicating word processors or micros while others are standard computer terminals lacking their own text-editing features.

- The user may allow the system to handle store-and-forward functions automatically, or special instructions may be entered in order to hold information for delivery at designated times. The drop times for messages might be held, for example, in order to transmit material from the East Coast to the West Coast at a particular hour or to send out information at night when the transmission rates are lower.

- If the electronic mail system is linked to a common electronic file or database, it will also be possible to send "attachments" with messages. This would permit one to access archival reports, previous memos, and other material that might be relevant to a current electronic mail communique.

- Special optional features may include personal calendaring, scheduling, filing, and a whole host of possibilities that are only limited by the inventiveness of system designers.

Not all of the above electronic mail features will be found on all computer-based systems. The items shown on this "wish list" are all possible, however, and are being offered in one way or another by vendors in various segments of this market. Use this list as a point of reference when comparing systems to discover the many levels of computer-based electronic mail systems that are being offered by vendors.

Following is an overview of computer-based systems: communicating devices, remote computing services, and in-house systems.

Communicating Devices

The use of word processors to handle the input and manipulation of text information spawned a kind of grass roots effort to experiment with the electronic transfer of

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this material from machine to machine. By introducing communications as an important tool to the text processing environment during the mid-1970s, proponents of word processing actually invented electronic mail for the office environment. In some cases, this capability remains very rudimentary, but in others it has evolved into the full-blown establishment of local networks and clusters of WP workstations for the efficient creation and electronic transfer of text information. Communications allows peripheral devices such as electronic typewriters, OCRs, photocomposition machines, and Telex I and II terminals to communicate with word processors. Text is actually communicated from an OCR to a word processor. Telex I and II are more applicable to electronic mail applications. Further electronic capability is provided by communications, which enables a word processor to access remote databases and which is now more commonly providing connections to other types of communicating products, such as electronic typewriters and personal computers, in both single- and multiple-vendor environments.

One does not decide to implement electronic mail and then buy word processors solely for the purpose of networking them. Electronic mail is really just viewed as another application on a system. Most vendors of office automation systems and software have recognized this and offer electronic mail functions as part of their overall software strategy.

Communications is available as an option for almost all electronic typewriters and is used to transmit data to or from a variety of equipment, including other electronic typewriters, word processors, computers including PCs, and TWX/Telex devices. Additionally, some electronic typewriters can operate within a local area network (LAN).

Although many electronic typewriters have both send and receive capabilities, most electronic typewriters are receive-only units, providing for the ability to serve as output, letter-quality printers for personal computers. On send/receive units, data can be transmitted via direct connection either locally or through telephone lines, and documents can be received in the same format in which they are sent. In addition, access to remote databases and news services is also available. Protocols include RS-232-C, Centronics, IEEE, TTY, DTR, X-on/X-off, and ETX ACK. ASCII code sets are often used. Speeds range from 110 to 9600 bps.

The microcomputer is certainly among the most popular desktop devices in companies big enough to consider implementing electronic mail—and it is a natural to support that application. Unlike communicating word processors and electronic typewriters, microcomputers are found across all levels of office workers, and can be used for a variety of applications besides electronic mail. Today, micros, or personal computers, are networked, connected to mainframes, minis, and each other in all conceivable arrangements, and can be equipped to emulate most standard communicating terminals. Virtually all of the major office automation vendors provide some kind of microcomputer as a workstation for their mainframe-based integrated office software, including the electronic mail application.

Remote Computing Services

Even if your company does not have its own computer or network on which to implement electronic mail, you may be able to add it to your operations through the use of a remote computing service. The idea behind remote computing is that you share the use of an off-site computer in order to provide specific data or text processing functions for your company without having to invest in the installation of your own computer equipment. The broad range of remote computing services now available includes general-purpose remote batch processing facilities, interactive time-sharing for scientific and business applications, and many dedicated facilities for specific industry applications such as insurance, banking, or medical administration. In most cases, you can make use of these services by simply installing a teletypewriter or other data terminal in your office or plant and communicating over telephone lines, with one or more powerful computers that may be located nearby or hundreds of miles away. As the use of remote computing has become more common in the general office environment, most vendors of these services have added electronic message applications to their rosters of available functions. In some cases, this has grown into communicating electronic message services, otherwise known as electronic mail.

In the context of electronic mail, there are two basic types of remote computing firms that one can turn to for assistance:

- Vendors of value-added communications facilities.

- Vendors of remote or time-share computing services.

The primary business of vendors of communications facilities is the organization and movement of data and text communications over their own non-Bell facilities. For this service, they add certain processing aids to assist the user in better organizing and channeling this information. By adding special computing power dedicated to the control and routing of text messages over their own communications lines, they are able to offer some impressive electronic mail systems for end users.

The vendors of traditional remote and time-share computing services, on the other hand, have one serious disadvantage when compared to the facilities vendors; they usually don't have their own communications network. Instead, access to these services is usually accomplished over the public telephone lines at fairly slow speeds (usually 4800 bps). These companies have for many years offered text message systems and services, but until they are able to handle the communications issue, they will be weak in the area of electronic mail services.

The advantages of using a remote computing service to handle your electronic mail needs are many. First, you can have the benefit of a computerized store-and-forward network without the expense of installing and maintaining your own computer. You only pay for the privilege of accessing the system and the cost for renting a terminal to use as an input device. The second advantage is that when you subscribe to one of these services, you instantly have communications access to a large geographic area, perhaps even across the nation. Some services also allow access to Hawaii, Mexico, Canada, and other locations in North America, but international service to other areas is not common. The latter problem will most likely be solved through the use of satellite links or the interfacing of these networks with the traditional international services like those marketed by Western Union International. The third advantage of remote electronic mail services is the ease of operation and training required to get a system running.

There are, of course, some possible drawbacks to using a remote computing service to handle electronic mail functions. These are as follows:

- **High Communications Costs**—Unless you choose a facilities company with its own fixed line rates or a remote computing service that offers unlimited local access in your area, communications costs can easily represent the largest component of your remote computing bill. One reason for this, obviously, is that access to most remote computing services will take place over standard voice-grade telephone lines that have a limited information carrying capacity. It's also true that all electronic mail systems—unless run internally by direct machine links—will entail communications costs to send messages. With an internal electronic mail system, however, you only pay for messages transmitted *out* of the system; with a remote service you also pay simply to *input* a message to the distant computer; in some cases doubling the amount of actual communicating you have to do.
- **Limited Database and Storage Access**—Because all information is stored at the remote site, one is limited in the amount of information that can be stored for extended periods of time, except at very high storage rates. This disadvantage naturally limits the ability of the user to employ an electronic mail service to access an on-line database of stored records and files.
- **Questionable Reliability**—This question should be uppermost in the minds of prospective remote computing users: Just how reliable is the service? Many early time-sharing networks earned notorious reputations for being down (out of service) more than they were up. Fortunately, a great deal of progress has been made since those days.
- **Slow Input/Output**—In a few remote computing networks, input and output speeds are still limited to 10 to 15 characters-per-second (cps) rates of conventional typewriter-style terminals. These low speeds are more than adequate for many applications, but in other cases they impose a severe restriction on throughput. To overcome this limitation, most time-sharing services now support 30-cps interactive terminals, and many offer 120-cps interactive units and/or much faster remote batch terminals.
- **Questionable Data Security**—When multiple users share a computer system, challenging problems are encountered in safeguarding the confidentiality and integrity of each user's programs and data files. Most of the commercial remote computing services have paid a good deal of attention to this security problem, combining special access protection with passwords and a variety of other techniques. Prospective users of any remote computing system should make sure that the available security provisions will adequately protect their interests.
- **System Loading Problems**—In addition to downtime resulting from the reliability problems discussed previously, a remote computing system may be unavailable when you need it because the system is "saturated." Saturation occurs when a remote computing system is being accessed by the maximum number of users it is capable of serving simultaneously. As the load on a system grows heavier, response times tend to increase, turn-around times get longer and throughput drops. Finally, when saturation is reached, no more users can be served until someone completes a job and disconnects.

For additional information on remote computing services, see Report RC70-100-101, "An Overview of Remote Computing Services."

In-House Systems

It is also possible to establish an electronic mail network in your own company using your own computing and communications resources. There are two basic approaches to this task. The first is to upgrade your existing computing equipment to handle text communications tasks. The second is to bring in a complete turnkey system that is specifically designed to perform electronic mail functions. Many companies that are currently using some form of computer messaging in-house have found it possible to upgrade their systems to handle electronic mail. Some are experimenting with electronic mail on PC/LAN configurations. Because of the growing interest in connecting PCs and other devices through local area networks, hierarchical networks are now being supplemented with departmental systems based on local network technology. The key component in a hierarchical network is often the communications processor. A communications processor is actually a computer that is dedicated to the control of electronic data and text traffic in a company's data communications network. In a distributed network, some of this controlling power may be decentralized, but the function of the communications processors is the same.

The chief components of a communications processor are the processor itself, an interface to the host computer, a communications multiplexer for the control of incoming and outgoing information, interfaces to other peripherals like terminals, and software to control all system functions.

All About Electronic Mail

▷ The primary functions of a communications processor are line control, character and message assembly, data and protocol conversion for interfacing units with dissimilar code structures, error control, message switching, and a host of other application-oriented functions that can be programmed by the user. There are communications processors designed to be used for data transmission only in a computer network, and there are processors like some digital PABX systems that are primarily designed to handle voice traffic, but which can also control data and text traffic.

Such communications processors or switches often employ store-and-forward message switching. In order to enhance operations to add electronic mail, the following considerations are important:

- Text editing features must be provided at some point in the system. This can either be through intelligent terminals (or word processors used as input terminals) or through text editing software loaded on the host computer.

- The code conversion capabilities of the communications processor can be upgraded to handle a wider variety of input station types, such as word processors, DP terminals, Telex I/Telex II terminals, facsimile, and OCR.

- The on-line storage capability of the host computer, or intelligent workstations, can be upgraded and linked to the communications processor in order to provide additional electronic filing space for mailboxes and records.

A local area network serving the electronic mail application precludes the use of a communications processor. Several LANs of the same type can be connected via bridges or combined with other types of networks (foreign LAN, SNA, X.25) via gateways to create a larger area of service. Electronic mail software can be maintained and distributed from one system designated for this purpose. This system can range from a PC on a departmental LAN, to a minicomputer on several "bridged" LANS, to the mainframe host systems on an SNA network. Of course, the larger the network, the more complicated it is to implement and maintain. One of the advantages of LAN processing is the inherent advantage of distributed systems—eliminating the possibility of total network failure.

There are two ways to *add* electronic mail functions *in-house* using a computer. You may obtain special software for your existing computer network to provide the capabilities, or you may add a complete computer system or network that is designed to perform electronic mail functions. In either case, the end result is usually a complete text processing system that not only transmits text messages but is also capable of manipulating, editing, merging, and storing text for all general purposes. The use of a database for commonly stored and addressable information is also assumed, as is the ability to perform sophisticated text searches and retrievals. The computers being used for these purposes aren't necessarily large mainframes either. Datapoint, for example, employs electronic mail software on its integrated office system which uses distributed minicomputers as the processors. In conjunction with these relatively small processors, they supply various forms of mass storage and database software to ease the storing and retrieval of text information.

A user-owned computer network will primarily be thought of as an internal system and so, too, will the application of electronic mail. It is certainly possible to send messages to remote sites as well, but one must then employ higher cost telephone lines or communications services described earlier.

FACSIMILE

Any discussion about electronic mail must include the use of facsimile devices as a faster alternative to the use of regular mail service. In the office environment, facsimile is used to replace lengthy and costly phone calls and for the transmission of messages and sketches. Facsimile may also be employed in place of teletype message transmission and to replace typing operations where annotated letters, handwritten memos, and sketches serve as input documents. One of the key features of facsimile is the ability to operate in an unattended mode. Unattended systems coupled to ordinary telephone networks can send/receive pages automatically, using auto answer phone interfacing. Some units even allow off-hour transmission on an unattended basis via automatic telephone dialing attachments. Positive feedback provides the sender with confirmation that the document has been transmitted and copied at the remote location.

In the true spirit of electronic mail, any user from any company must be capable of communicating with any other user in any other company, whether or not they are employing the same type of facsimile device. To establish this technological similarity between equipment, the standards written and adopted (1981) by Study Group XIV of the Consultative Committee on International Telephone and Telegraph (CCITT) must be adhered to by equipment manufacturers. Simply stated, the groups cover the following facsimile classes:

- **Group 1**—Four- and six-minute analog facsimile machines, including many of the older units manufactured prior to the establishment of the CCITT standards.

- **Group 2**—Two- and three-minute analog facsimile machines, a standard that has been widely used by vendors in the design of machines since about 1978.

- **Group 3**—Digital facsimile machines operating at one minute or less, over standard, voice grade telephone lines.

- **Group 4**—High-speed digital (in the area of 56,000 bps), high-resolution (at least 240 by 240 lines per inch and as high as 400 by 400 lines per inch) facsimile devices, which connect directly to digital circuits and possess satellite compatibility and high-level protocols. ▷

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All About Electronic Mail

▷ In examining the use of facsimile for electronic mail, Group 3 machines are currently the most cost effective for the average user. In high-volume applications, digital units falling in the Group 3 and 4 categories will clearly have the competitive edge in relation to speed, copy quality, and cost.

Facsimile cuts the largest, and most important, hidden business cost—the time and money lost in waiting for information. Toward this end, facsimile equipment makes it possible to send or receive urgently needed documents across any distance in minutes.

Electronic mail service is one area that is greatly expanding the current use of facsimile products. The rising costs of mail and telephone line services coupled with the availability of lower cost, subminute facsimile models and store-and-forward fax switching makes facsimile a prime candidate for such electronic mail applications.

FACSIMILE SERVICES

Through independently operated facsimile services, it is possible for the occasional or moderate user of facsimile to use this form of electronic mail without having to establish a private fax network. Facsimile services come in a number of forms, some domestic and some international. They are generally run by those organizations that already operate established common carrier communications services; ITT, MCI International, Graphnet, and RCA Q-Fax are four notable examples. Input to the fax service may occur in one of three ways:

- Directly from a user-owned facsimile device to the communications center of the fax service. In some cases, this facsimile machine might even be rented from the service company.

- Directly from a nonfax terminal into the communications center of the fax service. Methods may be via computer, Telex I/Telex II, or communicating word processors.

- Over-the-counter delivery of documents to a facsimile service center, or by voice message over a telephone, thereby eliminating the need for any type of terminal or fax machine for input purposes.

Facsimile services provide a number of significant advantages over maintaining and operating one's own fax network. These include:

- Elimination of additional equipment cost, unless one decides to install fax terminals where needed.

- The availability of private voice grade and digital lines for maximum transmission speed and quality.

- The ability to interface machines that are otherwise incompatible. Many of the fax service companies provide computerized code conversion or even the physical movement of a fax copy from one type of fax machine to another, in order to handle compatibility problems. This also allows one to input a message using one form of technology (Telex I, computer terminal, etc.) and have it delivered to a fax machine at the receiving station.

- Other value-added features include store-and-forward processing of documents, broadcasting to multiple recipients, and after-hours transmission.

The customer of a facsimile service can be charged for the service in a number of ways. For those users who have a direct tie-in to the service via a fax machine or terminal, there is usually an access charge for the service as well as a per-message charge based on line time. Some firms will also offer a variety of priorities for the transmittal of messages, ranging from 15 minutes to a few hours or overnight. The higher the priority of the transaction, the higher the cost. For those users that merely require walk-up service from a fax carrier, charges are merely issued on a per-message basis. The walk-in-type service is generally used by the occasional customer who demands faster speed than a courier service can provide.

NONIMPACT PRINTERS

Nonimpact printers, also known as electronic copier/printers, have the potential to play a major role in electronic mail/document distribution. Accepting digital input from one or more sources, they not only provide hard copy output, but also serve as communications terminals capable of transmitting text, data, and, in some cases, graphics from one site to another at high speeds. These units are nonimpact devices—predominantly electrostatic-based laser printers—which translate digital information from word processors and/or computers into character bit patterns. Output is of letter quality or near letter quality on cut sheets. It is the communications and storage capabilities of the sophisticated systems which enable them to serve as focal points in electronic mail/document distribution networks.

Electronic printers can be employed in an electronic network in several ways. A unit can be hardwired to communicating word processors or data processors, interfaced with local area networks such as Xerox' Ethernet or Wang's Wangnet, or linked to workstations and other nonimpact printers at remote sites via communications lines. The electronic printer mail network is especially suited to companies with several branch offices and large volumes of internal correspondence. Immediate targets are institutions in which communications and distributed printing are essential and cost justifiable—banks, utilities, insurance companies, and government agencies.

Some systems accept digitized originals which are sent from one or more sources—a word processor, computer, or prerecorded magnetic media. This information can be sent via communications to the printer, or hand delivered and entered via magnetic media. The text or data is loaded into the printer's buffer memory and addressed to the appropriate receiving site(s). ▷

On the receiving end, the incoming text enters the printer's buffer, is electronically processed and sorted according to the printing instructions, and is stored until a hard copy of the document is requested. (The size of the buffer storage varies with each machine; models are available that can store 1 to 1,000 pages of text at a time.) To obtain a hard copy of a stored document, a recipient simply instructs the printer to print out any messages in his/her mailbox. At this time, the operator can also request multiple copies of the message and can keep the document stored on the diskette as long as desired.

Approaching the distribution of messages from another angle, IBM has designed a multipurpose device which can function as a facsimile terminal, graphics input scanner, and text printer. This unit, the Scanmaster 1, can capture, transmit, store, and print documents in noncoded form (from a facsimile-type scan of hard copy originals). In addition, a character generation feature enables it to serve as an output printer for coded information (text or data).

When the Scanmaster's host is enhanced with IBM's Image Distribution System software, the Scanmaster functions as part of an electronic mail network. The scanning unit can transfer a document to the host for distribution to multiple destinations; destination IDs are input by means of a preformatted cover sheet or a keypad. Communication, with CCITT Group 2 analog facsimile units is also possible via a Scanmaster CCITT option.

Nonimpact printers that are equipped to scan documents for digitizing purposes will pose a threat to the continued existence of traditional facsimile machines. Realistically, the evolution of facsimile as we know it today is entrusted to the future of the electronic printer. Not only are such devices faster than facsimile when transmitting textual information, but they provide much better image quality. When scanning graphics with a laser, however, electronic printers are going to encounter the same problem that facsimile has: unless the information is encoded in bytes, the datastream won't be readable by a computer. That means that the storage of scanned input will face the same space limitations confronted by facsimile input when it meets the computer.

In general, nonimpact printers still bear expensive price tags; however, the past few years have witnessed the introduction of several low-end units, employing laser technology, with price tags that will make them appealing to small companies and possibly even home users. In addition, a number of manufacturers are developing lower cost printers based on potentially inexpensive imaging processes such as ink jet and magnetic printing. Should such devices prove to be viable alternatives to laser printers, and should the costs of employing laser technology continue to come down, nonimpact printers may one day be placed on every desk or at each point of need.

Additional strengthening of the electronic printer/mail connection will be largely tied to the development of integrated office systems and the use of local area networks such as Xerox Ethernet and Wang Wangnet. In these environments the demand for sophisticated electronic mail applications will be most important, and the use of electronic printers as coordinating and distributing points will increase.

VOICE MAIL

Like electronic mail, voice mail is intended to automate the delivery of messages over a private or switched telephone network. It does this through the use of processed voice input rather than through hard copy or keyboarded information. Controlled by a computer, it offers the same variety of message prioritization and store-and-forward capabilities as keyboard- or graphics-oriented electronic mail systems. In practice, it is generally used for brief one-way communications rather than for lengthy oration primarily because keyboard-based systems are more cost effective for exchanges of extended documents and reports. Its use, however, is totally dependent on the desires of the operator, and in many cases voice mail can offer significant time savings for those people who normally require others to type and distribute their messages. Voice mail permits one to instantly access any party on the network who has a telephone on his/her desk.

How does voice mail work? First, it should not be confused with voice recognition; there is no machine recognition of any of the voice input being employed here. To initiate a voice mail transaction, the user calls a computer by means of a touch-tone telephone. Through the use of the touch-tone keys on the telephone, the user can request a voice mail transaction, identify the telephone number of the recipient's phone, and designate any time priorities if needed. The user then speaks the message over the telephone to the computer, which digitizes the analog voice signal, forwards the message to the receiver, and converts the digital message back to a synthesized, analog voice message for the person at the other end. If the receiver's line is busy, the computer will be able to store the message and forward it at a later time. The storage of this information also permits a user to browse through his or her voice "mailbox" in order to hear what is there and to determine which messages require prompt attention.

As a means for electronic mail, voice processing of messages has a number of interesting features and advantages:

- Voice mail is accessible to anyone in a company that has a telephone.
- As a one-way form of messaging, voice mail does not require the recipient to be present in order to receive a message. It thus eliminates the wasteful necessity of playing "telephone tag" when trying to contact someone.
- Voice mail can be used by individuals who are not keyboard oriented, particularly managers and executives.
- Voice mail can easily double as a means for organizing central dictation input to a typing center.

- Voice mail can be used in combination with the delivery of hard copy or keyboarded information by other electronic mail methods.

Voice mail is generally associated with internal office automation systems, such as those controlled by a local area network architecture or centralized PABX device. It can be leased as a service on a time share basis or installed on premises for in-house control.

The subject of voice processing is often discussed today in reference to some of the newer PABX devices that are being designed to handle both voice and data input. To do this, such systems digitize voice in order to handle it like any other form of electronic input. Companies like Datapoint and Rolm are already providing this PABX capability and are expected to pursue voice processing in the future, as will a number of other vendors of information switches for the office.

When considering the implementation of a voice mail system, one should examine the field while keeping in mind a few preferential functions. Some of these are as follows:

- The ability to handle inside as well as outside calls on the system.
- The ability to leave messages for outside callers and inside callers.
- The ability to store and forward messages automatically and at specific times designated by users.
- The ability of a system to automatically cue the recipient of a message that there is information in his/her voice mailbox.

These and other functional characteristics should be kept in mind by all potential customers of voice mail vendors.

The prices of currently available voice mail systems will naturally depend on the specific configurations required, but even the prices for small, start-up operations begin in the $25,000 range. Although the current market offerings are certainly worth investigating, it is also advised that users watch for similar activity coming from the companies that also supply their existing, internal PABX telephone exchanges.

WESTERN UNION WORLDWIDE ACCESS

WESTERN UNION ELECTRONIC MAIL

Western Union Electronic Mail, Incorporated, a subsidiary of Western Union Corporation, offers a complete line of value-added electronic messaging services. It has the capability of handling any volume of written communications originating from a wide variety of input sources. It also addresses the communications needs between the "equipped to the nonequipped" market.

There are three major business areas which make up Western Union Electronic Mail services. The first area deals with the alternative input methods by which customers may access this high-speed written communications system. Acting as a sophisticated computer service center, Western Union Electronic Mail offers three primary input type services:

- Operator Assisted Input—allows the user to call a toll-free number and dictate a message to a prestored list of addresses for overnight delivery.
- Terminal Input—messages may be originated from Telex I/II terminals, communicating word processors, special EMPACT terminals provided by Western Union or direct computer transmission. More than 200 different models of office terminals have been designated as being compatible with the communications system.
- Electronic Mail Processing Center Input—messages may be transmitted to Western Union via facsimile, magnetic tape, hard copy source documents, or direct bisynchronous transmission.

The second significant business area involves the added-value services offered to customers. These services include:

- Key-to-tape conversion of mailing lists.
- Computer storage of frequently used letters, key paragraphs, mailing lists, and sender names and business titles.
- Up-to-date industry address lists for use in conjunction with customer mailings. These lists are updated frequently to ensure accuracy.

In the third service area, Western Union Electronic Mail has a variety of message options from which to choose. The message options are based on the required speed of delivery, content, and domestic versus worldwide destination. The user's electronic message choices include the following:

- Telex I/II—a store-and-forward terminal service which reaches 200,000 subscribers in the United States and more than 1.7 million terminals worldwide via the international telex network.
- Express Document Service—overnight delivery of documents printed on bond paper by courier.
- Mailgram—delivery of the Western Union Mailgram is achieved via joint arrangement with the United States Postal Service. A Business Reply feature provides rapid feedback. Certified Mailgram gives the sender written verification of delivery to the recipient.
- Priority Letter—offers two-day delivery with upper/lowercase characters and includes corporate logo and signature reproduction.

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- Computer Letters—are delivered in three to five days plus the delivery time needed to send the letter via first-class mail. The Computer Letter offers varied text personalization, insertion of brochures, and a business reply envelope.

- International Cablegram—offers one-day delivery of a message to any one of 154 countries.

- Worldwide Mailgram—Mailgram service is currently available to the United Kingdom and Argentina.

Any company interested in using Western Union Electronic Mail should contact their local Western Union office for more details and pricing information.

ELECTRONIC MAIL VENDORS & SUPPLIERS

TELEX I/TELEX II SERVICES

Western Union Telegraph Company
1 Lake Street
Upper Saddle River, NJ 07458 (201) 825-5000

REMOTE COMPUTING SERVICES

ADP Network Services
175 Jackson Plaza
Ann Arbor, MI 48106 (313) 769-6800

A T & T
Information Systems Group
Morristown, NJ 07960 (201) 898-2000

Bowne Information Systems
400 Oser Avenue
Hauppauge, NY 11788 (516) 213-0333

CompuServe, Incorporated
P.O. Box 20212
5000 Arlington Center Boulevard
Columbus, OH 43220 (614) 457-8600

Computer Projects, Incorporated
Four Seasons Executive Center
9B Terrace Way
Greensboro, NC 24703 (919) 292-4820

Computer Sciences Corporation
2100 East Grand Avenue
El Segundo, CA 90245 (213) 615-0311

Dialcom, Inc.
6120 Executive Boulevard
Rockville, MD 20852 (301) 881-9020

General Electric Information Services Company (GEISCO)
401 North Washington Street
Rockville, MD 20850 (301) 340-4000

Immedia Telematics Incorporated
98 Cameron Street, C.P. 429
Hudson, Quebec Canada J0P 1HC (514) 458-2121

Inconet Corporation
1 State Street Plaza
New York, NY 10004 (212) 943-8260

Infomedia Corporation
801 Traeger Avenue, Suite 275
San Bruno, CA 94066 (415) 952-4487

Interactive Systems, Incorporated
810 Passaic Avenue
West Caldwell, NJ 07006 (201) 227-6511

Interlink Business and Communications Services (IBCS)
247 Mill Street
Greenwich, CT 06830 (203) 531-1558

MCI Mail
2000 M Street, NW Suite 300
Washington, DC 20036 (202) 293-4255

Microcom, Incorporated
1400A Providence Highway
Norwood, MA 02062 (617) 762-9310

Mohawk Data Sciences Corporation
7 Century Drive
Parsippany, NJ 07054 (201) 540-9080

Network Technologies International, Incorporated
315 West Huron
Ann Arbor, MI 48103 (313) 994-4030

Proprietary Computer Systems
16625 Saticoy Street
Van Nuys, CA 91406 (818) 781-8221

Source Telecomputing Corporation
1616 Anderson Road
McLean, VA 22102 (703) 734-7500

Telecom Canada
160 Elgin Street
Ottawa, K1G, 354, Canada

Telenet Communications Corporation
8229 Boone Boulevard
Vienna, VA 22180 (703) 442-1000

Tymnet, Incorporated—see Tymshare, Incorporated.

Tymshare, Incorporated.
20705 Valley Green Drive
Cupertino, CA 95014 (408) 446-7692

The Western Union Telegraph Company
1 Lake Street
Upper Saddle River, NJ 07458 (201) 825-5000

IN-HOUSE ELECTRONIC MAIL SYSTEMS

Amtel Systems Corporation
1293 Anvilwood Avenue
Sunnyvale, CA 94089 (408) 734-5092

Applied Data Research, Incorporated
Route 206 & Orchard Road, CN-8
Princeton, NJ 08540 (201) 874-9000

Burroughs Corporation—see Unisys Corporation

Cado Systems Corporation
2771 Toledo Street
Torrance, CA 90503 (213) 320-9660

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Case Communications, Incorporated
2120 Industrial Parkway
Silver Spring, MD 20904 (301) 381-2300

Computer Corporation of America
Four Cambridge Center
Cambridge, MA 02142 (617) 492-8860

Computer Projects, Incorporated
Four Seasons Executive Center
9B Terrace Way
Greensboro, NC 27403 (919) 292-4820

Convergent Technologies, Incorporated
2700 North First Street
P.O. Box 6685
San Jose, CA 95150 (408) 434-2848

Cosmo Software
3239 West 14th Street
Cleveland, OH 44109 (216) 861-5594

Cross Information Company
1881 9th Street, Suite 311
Boulder, CO 80302 (303) 444-7799

Current Networks
1101 San Antonio Road, Suite 412B
Mountain View, CA 94043 (415) 968-7700

Data General Corporation
4400 Computer Drive
Westboro, MA 01580 (617) 366-8911

Datapoint Corporation
9725 Datapoint Drive
San Antonio, TX 78284 (512) 699-7000

DB Systems, Inc.
Two South Patton Avenue
Arlington Heights, IL 60005 (312) 870-8665

Digital Equipment Corporation
Continental Boulevard
Merrimack, NH 03054 (603) 884-5111

Executive Software, Incorporated
2024 Hollyvista Avenue
Los Angeles, CA 90027 (213) 660-2019

Fischer Innis Systems Corporation
4073 Merchantile Avenue
Naples, FL 33942 (813) 643-1500

H & W Computer Systems, International
P.O. Box 4785
Boise, ID 83711-4785 (208) 377-0336

Hewlett-Packard Information Systems Division
19420 Homestead Road
Building 43U
Cupertino, CA 95014 (408) 725-8111

Honeywell, Incorporated
200 Smith Street
Waltham, MA 02154 (617) 895-6000

Immedia Telematics Incorporated
98 Cameron Street, C.P. 429
Hudson, Quebec Canada J0P 1HC (514) 458-2121

Infomedia Corporation
801 Traeger Avenue, Suite 275
San Bruno, CA 94066 (415) 952-4487

Interactive Systems, Incorporated
810 Passaic Avenue
West Caldwell, NJ 07006 (201) 227-6511

International Business Machines
Old Orchard Road
Armonk, NY 10504
(Contact your local IBM office)

Microcom, Incorporated
1400A Providence Highway
Norwood, MA 02062 (617) 762-9310

Network Technologies International, Incorporated
315 West Huron
Ann Arbor, MI 48103 (313) 994-4030

On-Line Software International
Fort Lee Executive Park
2 Executive Drive
Fort Lee, NJ 07024 (201) 592-0009

Soft-Switch, Incorporated
200 N. Warner Road
King of Prussia, PA 19406 (215) 768-9330

SofTest, Incorporated
555 Goffle Road
Ridgewood, NJ 07450 (201) 447-3901

Software Connections, Incorporated
1435 Koll Circle, Suite 112
San Jose, CA 95112 (408) 293-3400

Systar Corporation
1762 Technology Drive, Suite 208
San Jose, CA 95110 (408) 280-7066

Telenet Communications Corporation
8229 Boone Boulevard
Vienna, VA 22180 (703) 442-1000

Top Down Systems
Division of Office Express, Inc.
414 Hungerford Drive, Suite 236
Rockville, MD 20850 (301) 251-9400

Unisys Corporation
1 Burroughs Place
Detroit, MI 48232 (313) 972-9120

Wang Laboratories, Inc.
1 Industrial Avenue
Lowell, MA 01851 (617) 459-5000

Westinghouse Electric Corporation
Advanced Systems Technology
Management Systems
777 Penn Center Boulevard
Pittsburgh, PA 15235 (412) 825-7000

Wizard Computer Products
P.O. Box 1867
Greenville, SC 29602 (803) 244-4110

Xerox Corporation
Office Systems Division
800 Long Ridge Road
Stamford, CT 06904
(Contact your local Xerox representative)

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All About Electronic Mail

KEY TO COMPUTER-BASED MESSAGING SYSTEMS TABLE ENTRIES

The following definitions are a guide to the computer-based messaging systems table entries that follow the vendor listing.

COMPANY and **PRODUCT NAME** identifies the vendor/manufacturer and the name of the specific computer-based messaging system.

Type indicates whether the system is an In-House System or a Remote Computing Service. An In-House System may use special software with existing computers or provide new processors and software to operate over an internal or private communications network. A Remote Computing Service supplies electronic mail capabilities on a time-shared basis. This means that a subscriber uses a terminal at his/her location to access an off-site shared computer that is equipped with electronic mail software.

HARDWARE

For every In-House System, it is important to determine what **Computer** the software package will run on. This information is not important to the user who is accessing a Remote Computing Service.

Memory Requirements specifies the amount of computer memory that is necessary in order to run a specific software package.

The types of **Terminals** necessary to access a specific computer-based messaging system are detailed in this entry.

SEND FUNCTIONS

Prompting refers to the system's ability to step a user through a specific task.

Editing is the ability to alter a message before it is sent to a recipient.

Go On refers to the ability to resume an interrupted execution without having to begin all over again.

A **Help Facility** describes the different system commands and how to use them.

The **Append** feature allows the user to add comments to a received message before rerouting the message to others.

The **Withdraw** function permits a user to cancel a message that has been sent but not received (read) by the recipient.

Some systems have a **Message Length Restriction** that is generally expressed in lines or characters.

Trash refers to a prepared message that is discarded before it is sent to anyone.

Once a message has been composed, the user must determine how he/she wants to **Distribute** the message. In general, messages can be sent to specific individuals, to groups of individuals, and/or to yourself. Some systems offer other variations including the ability to send messages to persons not on the system.

Store & Forward refers to the ability of the system to store a message for delivery at a predetermined time in the future.

RECEIVE FUNCTIONS

Most systems allow the user to **Scan the Mailbox for Incoming Messages**, and many systems permit the user to **Scan the Mailbox for the Status of Previously Sent Messages** (those messages sent but not read by the recipient).

When a user sends a **Registered Message**, he/she always receives confirmation that the message has in fact been received.

Some systems **Acknowledge the Message Receipt** of every message sent.

Message Status refers to the type of information the system provides about each message prior to reading the actual text of the message. Some possible responses include message header (providing details such as the name of the originator, the subject of the message, and the date and time it was sent), urgency, and the privacy level of the message.

FILE FUNCTIONS

All systems with a **Filing** capability have system files. Some examples of system files would include Unread, Read, Unsent, and Sent. If a system also has user filing, it means the user can create his/her own files (i.e., monthly sales totals, future projects, etc.) in addition to the filing capabilities provided by the system.

A **Directory** provides a listing of the different files in the system.

Message Storage can be for an indefinite period of time and/or for a specified period of time in which case the files would be automatically purged of any messages filed longer than allowed by the system (e.g., 180 days).

Text Retrieval refers to the way in which messages can be searched for in the system (e.g., key word, full search, subject category, author, date sent, originator, etc.).

A **Tickler File** is maintained to provide reminders to the user (i.e., telling him/her that a report is due on a particular date).

An **Electronic Wastebasket** provides the user with a queue within the system to which unwanted messages can be sent. There is usually a specified period of time during which the message is stored in this queue before it is purged from the system.

MISCELLANEOUS

A **Directory of Users** provides a listing of all people who are able to use the system.

The **Automatic Log Off** feature allows the system to disconnect a terminal that has been logged on to the system after a specified period of inactivity.

Many systems are designed to maintain the **Security** of the information through the use of passwords, encryption, and/or database control (which manages the access to and manipulation of information in the system).

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KEY TO COMPUTER-BASED MESSAGING SYSTEMS TABLE ENTRIES (Continued)

Management Tracking is available with some systems, and it provides management reports such as the total number of messages sent on a particular day, how many messages a certain originator sent, etc.

Customization of Options is available with some systems so an organization can tailor certain features to meet its particular needs.

Certain systems are designed to be able to **Access Outside Services** such as Telex I and Telex II.

The final table entries provide the **DATE OF INTRODUCTION, PRICING**, and any **REMARKS** or **OTHER FEATURES** that may be of interest to the reader.

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All About Electronic Mail

COMPANY	ADP Autonet	Amtel Systems Corporation	Amtel Systems Corporation	Applied Data Research, Incorporated
PRODUCT NAME	AutoMail	Messenger III	Message Line	ADR/eMail
TYPE	Remote computing service	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	ADP's DECsystem-10	Any available computer	IBM Personal Computers and Tandy Personal Computers	IBM 370,30XX;IBM 43XX
Memory Requirements	Not applicable	—	—	85KB prog. stor; 50KB dynamic storage for each concurrent task
Terminal(s)	Any Async terminal, communicating word processor or micro-computer	Any terminal or personal computer	—	IBM 3270 compatible, TTY compatible
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	None	Standard	Standard	Standard, also Go Back
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	Standard	Standard	Standard
Message Length Restriction	None	None	None	999 pgs.; ea. pg. up to 99 lines
Trash	Standard	Standard	Standard	Standard
Distribution	Indiv., groups, self, dist. lists, bul. brd.	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self, glob. or pers. dist. lists, bul. brd.
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Optional	—	—	Standard
Registered Messages	Standard	—	—	Optional
Acknowledges Msg. Receipt	Only if sent registered	—	—	Standard
Message Status	Message header and scan summary	—	—	Message header, privacy level, urgency
FILE FUNCTIONS				
Filing	System, user, bul. brd.	Customized	Customized	System, user bul. brd.
Directory	Standard	Customized	Customized	Standard
Message Storage	For indef. time period, opt. periodic purging.	—	—	For indef. time period, auto. periodic purging
Text Retrieval	Subject category, date, author, date ranges, status	Keywords, author, date, message number	Keywords, author, date, message number	Subject category
Tickler File	Standard	—	—	Standard
Electronic Wastebasket	Standard	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Optional	Standard	Standard	None
Security	Password, lockbox	Password, access codes	Password, access codes	Password, encryption
Management Tracking	Optional	Standard	Standard	Standard
Customization of Options	Available	Available	Available	Available
Ability to Access Outside Ser.	Optional	Standard	Standard	Optional interface
Outside Services Accessed	Telex I, Telex II	Telex and all general information sources	Telex and all general information sources	Optional interface, opt. calendar system
DATE OF INTRODUCTION	September 1982	—	October 1982	September 1982
PRICING				
Purchase/Lease	Not applicable	$1,000 to $80,000	$18,000 to $40,000	$35,100 (OS systems); $21,500 (DOS systems)
Subscription	$100/mo plus usage	Not applicable	Not applicable	Not applicable
REMARKS & OTHER FEATURES	Integration w/other ADP Services available. Delegation of Message Receipt, Process-to-Process Level Comm. Int'l access via IRC., Priority messages.	Customized system which provides electronic mail functions plus message and memo delivery via power lines, hardwired phone lines, voice synthesizer. Automatic delivery to desktop printers and display devices.	—	Calendar and Surrogate processing are stand. Opt. DISOSS interface, PC File Transfer. PC eMail provides electronic mail functions for stand-alone personal computers and LANs.

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All About Electronic Mail

COMPANY	AT&T	Bowne Information Systems	Cado Systems Corporation	Case Communications, Incorporated
PRODUCT NAME	AT&T Mail	Mailpac	Message Processing System II	BEELINE
TYPE	Remote computing service	Remote computing service	In-house system	In-house system
HARDWARE				
Computer(s)	PCs, word processors, data term., MS-DOS-based PCs, & UNIX system	Not applicable	Any Cado processor w/ 48KB storage	Compatible with all standard hardware
Memory Requirements	—	Not applicable	48KB	—
Terminal(s)	—	Any ASCII terminal, IBM 2741, most comm. WP's, bisync printers	Any TTY compatible	Teleprinter or data terminals (ITA-2 or ASCII), Case 310 and 320 terminals
SEND FUNCTIONS				
Prompting	Standard	Optional	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	—	Standard	Standard	Standard
Help Facility	Standard	Optional	None	Standard
Append	—	Standard	Standard	Standard
Withdraw	—	Standard	Standard	—
Message Length Restriction	—	100,000 lines	None	—
Trash	Standard	Standard	Standard	Standard
Distribution	Indiv., groups, self	To individuals, groups	To indiv., groups, self, any Telex I, Telex II mainf. (DDD, 2780/3780)	Standard
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	—	Standard	None	Standard
Scan Mailbox/Status of Previously Sent Messages	—	Standard	Standard	Standard
Registered Messages	Standard	Standard	None	Standard
Acknowledges Msg. Receipt	Standard	Standard	None	Standard
Message Status	—	Message header only	Standard	Standard
FILE FUNCTIONS				
Filing	Optional	System	None	Standard
Directory	Standard	Standard	Standard	Standard
Message Storage	—	For indef. time period	For indef. time period	For indef. time period
Text Retrieval	—	Key word, full search, subject category	Optional	Originator, date sent
Tickler File	—	Optional	None	Standard
Electronic Wastebasket	Standard	Standard	Standard	None
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	—	None	Standard	Standard
Security	Password	Password, random code number	Password	Password
Management Tracking	—	Optional	Standard	Standard
Customization of Options	—	Available	Available	Standard
Ability to Access Outside Ser.	Standard	None	Standard	Standard
Outside Services Accessed	Telex, WATS, and msgs. can be delivered via U.S. Postal Service	Not applicable	Telex I, Telex II, DDD, Source	Telex I, Telex II, Teletex, Public Networks
DATE OF INTRODUCTION		1969	June 1981	1984
PRICING				
Purchase/Lease	—	Not applicable	$510	Varies depending on user configuration
Subscription	Contact vendor for pricing	$3.95 to $12.00/hr connect time as used	Not applicable	—
REMARKS & OTHER FEATURES	Optional Mail Talk for use with touch-tone telephone.	—	Features such as Scan, Receipt, Append, Prompt, etc. can be developed for quantity orders.	Test Key Generation and Checking (security feature for banking applications). Dynamic Address Code Reallocation (personal password for redirecting messages).

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All About Electronic Mail

COMPANY	CompuServ, Inc.	Computer Corporation of America	Computer Projects, Inc.	Computer Projects, Inc.
PRODUCT NAME	InfoPlex	MAIL/204	FOX Electronic Mail & Data Communication Sys.	The LINC
TYPE	Remote computing service	In-house system	In-house system	Remote computing service
HARDWARE				
Computer(s)	Not applicable	IBM mainframe	Honeywell Level 6/DPS 6	Honeywell DPS6
Memory Requirements	Not applicable	Varies w/size of system	Min. 128KB	Not applicable
Terminal(s)	Async terminals	Any terminal	TTY, 3270 Bisync, word processors, personal computers	Most async or bisync communicating word processors and personal computers
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	Standard	Standard
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	None	Standard	Standard
Message Length Restriction	None	None	No intrinsic limit	None
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self, Telex, DDD, 2780, 3270	To indiv., groups, self
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	Standard
Registered Messages	Standard	Standard	Standard	Standard
Acknowledges Msg. Receipt	Only if sent registered	Standard	Standard	Standard
Message Status	Priv. level, resp. req., confid., recpt. reqstd.	Message header only	Message header, privacy level, urgency, length	Message header, priority, confidential
FILE FUNCTIONS				
Filing	System	System, user	System, user, company[1]	System, user, company[1]
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. time period, auto. periodic purging	For indef. time period	For indef. time period	For spec. no. of days, auto. periodic purging
Text Retrieval	Key word, subject category, topic, date sent, originator	Key word, subject category, originator, destination, carbon copy, date(s)	Key word, full search, subj. category, time, originator, destination, sequence number	Key word, full search, subj. category, time, originator, destination, file name & number
Tickler File	Optional	None	None	None
Electronic Wastebasket	Optional	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Standard	Standard	Optional	Optional
Security	Password, encryption, database controlled	Password, database controlled	Password, encryption, authorization level[2]	Password, encryption, terminal ID
Management Tracking	Standard	Available	Standard	Standard
Customization of Options	Available	Available	Available	Available
Ability to Access Outside Ser.	Standard	Standard	Standard	Available
Outside Services Accessed	Telex I, Telex II	Telex I, Telex II, DDD	Telex I, Telex II, DDD, Host computers, IRCs	Telex I, Telex II, IRC
DATE OF INTRODUCTION	1978	1981	1968	1983
PRICING				
Purchase/Lease	Not applicable	$20,000 and up	Software-$150,000 & up Hardware-$100,000 & up	By quotation
Subscription	$500/mo. min. various function charges[1]	Not applicable	Not applicable	$10/hr. connect time
REMARKS & OTHER FEATURES	Forms capability for fill-in-the-blank type messages. [1]The $500 InfoPlex initiation fee includes up to 2 days of user & administrator training w/in the 4-mo pilot period. Contact vendor for exact pricing.	Integrates with database management system.	Msg. switching, electronic filing, Bltn. Brds., videotex info. serv., computer conf., form ltr. wrtng., automated office controller. [1]Closed group. [2]Controls types of services avail. to a user.	Msg. switching, electronic filing, bltn. brds., videotex info, serv., computer conf., form ltr. writing, automated office controller. [1]Closed group.

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All About Electronic Mail

COMPANY	Computer Sciences Corporation	Convergent Technologies, Inc.	Cosmo Software	Cross Information Company
PRODUCT NAME	NOTICE	CT-MAIL	Extended Message System	Cross/Point
TYPE	Remote computing service	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	Not applicable	Convergent AWS, IWS, NGEN, Megaframe.	IBM System/34	IBM Personal Computers, IBM PC compatibles, and UNIX compatibles
Memory Requirements	Not applicable	384KB	32KB	128KB
Terminal(s)	Any async ASCII terminals, communicating WP, PC, electronic typewriters, IBM 3270.	Convergent AWS, IWS, NGEN, Megaframe.	Any IBM System/34 compatible	Personal computer terminals
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	None	Standard
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	None	Standard
Withdraw	Standard	None	None	Standard
Message Length Restriction	None	None	19 lines by 70 char.	—
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self, applications progs., consolidations, Telex.	To indiv., groups, self	To indiv., self	To indiv., groups
Store & Forward	Standard	Standard	None	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	None	Standard	Standard
Registered Messages	Standard	Optional	None	Standard
Acknowledges Msg. Receipt	Standard	Optional	None	Standard
Message Status	Message header, privacy level, urgency	Urgency, privacy, message header.	Message header only	Standard
FILE FUNCTIONS				
Filing	System, user	User	System, user	System, user
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. time period, auto. periodic purging	For indef. time period	Semi-automatic periodic purging	For indef. time period
Text Retrieval	None	Subject category, file name and numbers	Full search	Key word
Tickler File	None	None	Standard	Optional
Electronic Wastebasket	Standard	Standard	Standard	Optional
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Optional	None	None	Standard
Security	Password, encryption	Password	Password	Password, 3 levels
Management Tracking	Standard	Standard	Standard	Standard
Customization of Options	Available	Available	Not available	Available
Ability to Access Outside Ser.	Standard	Optional	None	Available
Outside Services Accessed	Telex I & II	Telex I/II, Easylink and access to CT-Mail via port. term. (opt.)	Not applicable	Various
DATE OF INTRODUCTION	October 1982	May 1982	1979	1984
PRICING				
Purchase/Lease	Not applicable	$3,500/1st copy, $700/copy- CT Mail	$200 (for single CPU); $400 (for dual CPU)	$695 PC/MS-DOS LAN version; UNIX version by quotation
Subscription	Subject to combination connect time & character charges.[1]	$1,000/1st copy, $200/copy-Telex I/II add-on or remote term. access.	Not applicable	Not applicable
REMARKS & OTHER FEATURES	PC software avail. to send msgs., files, and telexes. Binary file transfer to/from mailboxes. Applications interface, forms, international access & supp. [1]Conn. time varies with config.; discount avail. for vol. commit.; contact vendor for pricing.	Multi-windows, context sensitive, function keys to send any kind of message, text files, spread sheets, WP documents, binary files, voice.	—	Offers bulletin board, group conferencing, personal memo areas, and decision-support functions such as catagorizing and organizing ideas.

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COMPANY	Current Networks	Data General Corporation	Datapoint Corporation	Datapoint Corporation
PRODUCT NAME	Current Networks	CEO Integrated	EMS Network Controller	Vista-Mail
TYPE	In-house system	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	Current Networks desk console, host controller.	Data General Eclipse	Integrated Electronic Office Sta. (IEOS) processor or wksta.	Any Datapoint 8XXX-Series processor for cent. controller
Memory Requirements	—	1MB	128KB for 6600 processor; 64KB for workstation	408KB central control. (peak); 367KB (norm.); 128KB user/admin func.
Terminal(s)	Current Networks desk console or host controller	Any Data General Dasher Terminal and IBM PC compatible, Displayphone	Datapoint 8600, 3800 1800, 1550/1560	Datapoint 8XXX & 7XXX Series; IBM-compatible MS-DOS terminals
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	Standard	Standard
Help Facility	Standard	Standard	Standard	Stand. w/online tutorial
Append	None	Standard	Standard	Standard
Withdraw	None	None	Standard	None
Message Length Restriction	None	Unlimited	5MB	None including unlimited no. or length of enclos.
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self, outside systems	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self, persons not on system; Priv./shared dist.lists
Store & Forward	None	Standard	Administrator definable	Administrator definable
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	None	Standard	Standard	Standard
Registered Messages	Standard	Standard	Standard	Standard
Acknowledges Msg. Receipt	Standard	Standard	Standard	Standard
Message Status	Standard	Privacy level, urgency, certification	Message header, urgency, priority	Orig., encl.status, & status tracking[1]
FILE FUNCTIONS				
Filing	System	System, user	System, user	System, user
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. time period	For indef. time period	Automatic periodic purging	Standard, indefinite or with auto. purge
Text Retrieval	None	Key word, subject category, time/date, author	Free association search (AIM—Associative Index Method)	Keyword with full list of all messages each time mailbox is opened.
Tickler File	None	Standard	None	Available
Electronic Wastebasket	Standard	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Standard	Standard	None	User defined
Security	—	Password	Password, encoding	Password, encryption
Management Tracking	Standard	Optional	Standard & user written	Available
Customization of Options	Not available	Available	Available	Available
Ability to Access Outside Ser.	Standard	Optional	Standard	Mail Gateway Facility[2]
Outside Services Accessed	Telex I, Telex II	Telex I, Telex II, TTY, ASR/KSR, MCI Mail, Wang Mailway, IBM DISOSS	Telex I, Telex II, TTY, ASR/KSR 3435	Mail Gateway Facility[2]
DATE OF INTRODUCTION	1982		1980	1984
PRICING				
Purchase/Lease	Approx. $700/user including hardware	Initial license fee $3,000 to $22,000[1]	$500 System software (EMS); $750 User software license fee	$2,500 license fee quantity 1 system, discounts for quantity
Subscription	Not applicable	Not applicable	Not applicable	Not applicable
REMARKS & OTHER FEATURES	Current Networks is a dedicated sys. operatng over AC power lines; no additional wiring is required. All systems have integrated printers.	Integrates with other office automation products, graphics, spreadsheets. [1]Initial license fee varies depending on configuration. Voice Mail applications require the VMC/2 Controller.	Integrates w/Datapoint word processors & other office automation products.	Search and GoTo capability for enclosure reading. Integrated with WP for END/SEND automatic enclosure generation. [1]& user designated subj. [2]Facilitates interfaces to ext. devices or applications using CCITT-based X.409 syntax.

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COMPANY	DB Systems, Inc.	Digital Equipment Corporation	Executive Software Incorporated	Fischer Innis Systems Corporation
PRODUCT NAME	Network Messenger	ALL-IN-1	EXECMail	Emc^2
TYPE	In-house system	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	IBM 3033, Amdahl	DEC VAX	DEC VAX	Any S/370 architecture running VM, MVS, or VSE
Memory Requirements	Not applicable[1]	2MB minimum system	72KB—VAX	Depends on environment and number of users
Terminal(s)	Any 3270 compatible	DEC VT 100, VT 200 families, Digital personal computers or equivalents	VT-100, VT-200, VT-52 comp.	327x, TTY, PC emulating 327x
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Optional	Standard	Standard
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	Optional[1]	Standard	Standard
Message Length Restriction	Unlimited	None	None	None
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self, person not on system[2]	To indiv., groups, self	To Indiv., groups, self
Store & Forward	Standard	Standard	None	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	Standard
Registered Messages	Standard	Standard	Standard	Standard
Acknowledges Msg. Receipt	Standard	Standard	Standard	Standard
Message Status	Privacy level, urgency, msg. hdr.	Message header only	Message header, author, date, type & length	Standard
FILE FUNCTIONS				
Filing	System, user	System, user	System, user	Standard
Directory	Standard	Standard	None	Standard
Message Storage	For indef. time period (under recip. control)	For indef. time period	For indef. time period	For indefinite time period
Text Retrieval	Subject category and mailbox ID, keyword	Key word, subject category	None	Author, subject, date sent, file folder name
Tickler File	Standard	Standard	None	Standard
Electronic Wastebasket	Standard	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Standard	Optional	None	Standard
Security	Password, database controlled	Password	Password	Password, password encr., database cntrl.
Management Tracking	Optional	Standard	Standard	Standard
Customization of Options	Available	Available	Available	Standard
Ability to Access Outside Ser.	Optional	Optional	Standard	Standard
Outside Services Accessed	—	Dow Jones	Telex I, Telex II	—
DATE OF INTRODUCTION	1981	1982	1982	1984
PRICING				
Purchase/Lease	$12,000 to $15,000	$25,000	$495	Lease begins at $1,050/mo.; purch. at $24,000 and varies
Subscription	Not applicable	Not applicable	Not applicable	Not applicable
REMARKS & OTHER FEATURES	Automatic message purge based on date. [1]Runs under IBM's IMS/VS Data Base/Data Communications. Message access from any trmnl.,stnd. msg. prnt., optional access via PC or IBM PC compatible.	Calendar & calculator features also avail. DECmail is a subset of ALL-IN-1 & can be purchased as a separate package. [1]Standard on time deferred messages. [2]Name appears & sender is reminded to make hard copy.	—	Electronic forms; PC support; calendar, meeting scheduler. Connects users in all major IBM operating environments including MVS, TSO, MS, CICS, CMS, DOS, DISOSS

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All About Electronic Mail

COMPANY	General Elec. Infor. Services Company	H & W Computer Systems, International	Hewlett-Packard Company	Honeywell, Incorporated
PRODUCT NAME	Quik-Comm Service	SYSM[1]	HP Desk Manager	Electronic Mail
TYPE	Remote computing service	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	Not applicable	IBM mainframe, PCM	HP 3000	DPS 6 Family
Memory Requirements	Not applicable	126KB; 16 to 60KB/ additional transaction	1MB	1MB
Terminal(s)	Any ASCII terminal	32XX CRTs & printers, TTY terminals	Most ASCII terminals, Advance Mail software for PC to minicomputer integration	Honeywell 7300 or 7800, ASCII and TTY terminals
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	Standard	Standard
Help Facility	Standard	Standard	Standard	None
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	Standard	Standard	Standard
Message Length Restriction	2,500 lines	None	None	None
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self, registered mail user(s)
Store & Forward	Optional	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	Standard
Registered Messages	None	Standard	Standard	Standard
Acknowledges Msg. Receipt	Optional	Standard	Only if sent registered	Standard
Message Status	Message header only	New/Old, urgency	Priv. level, urgency, new, acknow. requested	Privacy level, urgency
FILE FUNCTIONS				
Filing	System, user	System, user	System, user, subject	System, user
Directory	Standard	Standard	Standard	Standard
Message Storage	Automatic periodic purging	For indef. time period, auto. periodic purging	For indef. time period	User- or supervisor-determined
Text Retrieval	Key word, subj. category, author, date, title, data ranges, receiver	Subject, author, folder/file, name, date	Subject, folder name, author, date created, type of item	Subj. category, author, title, comments, date message was created, filed or printed
Tickler File	Standard	Standard	Standard	Available
Electronic Wastebasket	Standard	Standard	Standard	—
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	—
Automatic Log Off	Standard	None	Standard	—
Security	Password, encryption, database controlled	Password and user exits	Password, database controlled, encryption	Password[1]
Management Tracking	Standard	Standard	Standard	Standard
Customization of Options	Available	Available	Standard	Available
Ability to Access Outside Ser.	Optional	Standard	Standard	Optional
Outside Services Accessed	Telex I	Telex, other[2]	2-way msg. exchange w/foreign networks via ARPANET; opt. Telex	X.25 Public Networks, Telex I, Telex II on special basis
DATE OF INTRODUCTION	1981	December 1982	1982	1981
PRICING				
Purchase/Lease	Quik-Comm IBM PC mlbx. sw pkg.-$189.	$12,000 (DOS), $14,000 (OS); $5,000 for opt. calendaring/scheduling	$5,200 to $17,100 (1st copy); $3,600 to $12,000 (addn'l copies)	$450/yr. prim. lic.; $340/yr. sec. lic. (tier 2 for DPS 645)[2]
Subscription	Elec Mlbx., Bul. Brd., WPXchange services. 3 serv. classes/each.[1]	Not applicable	Not applicable	Not applicable
REMARKS & OTHER FEATURES	[1]EM serv.-35¢ to $1. BB serv.-20¢ to 60¢. WPX serv.-$1.50 plus opt. Library services of 80¢. All prices are for specific no.of chars. only. Add. prem. rates, add. copy/page, translation rates, admin. charges, stor./retrvl. fees.	Optional calendaring/scheduling feature, electronic forms, auto. carbon copies, direct screen flow, Import/Export (MRO, IGC, RJC), PC interface. [1]Electronic mail for CICS. [2]Via application program interface (API).	Standard application integration, electronic forms processing, auto fwrd. & answer, opt. PC Mail interface, sched., full function filing, & comm to DISOSS & PROFS. Comm. via X.25/X.21 public data networks. Uses stand. HP Advancenet software.	[1]Can be user-defined in multifunction systems to include encryption or database control. [2] $250/yr. prim. lic.; $190/yr. sec. lic.(tier 1 for DPS 640 product line).

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All About Electronic Mail

COMPANY	Honeywell, Incorporated	Immedia Telematics Incorporated	Inconet Corporation	Infomedia Corporation
PRODUCT NAME	Electronic Mail	Immedia Express	Mailswitch	Jenny
TYPE	In-house system	In-house system & remote computing service	Remote computing service	In-house system
HARDWARE				
Computer(s)	DPS 6 Family, OMS	Tandem	Not applicable	HP 3000
Memory Requirements	1MB	—	Not applicable	—
Terminal(s)	Honeywell terminals (except 7700) and most ASCII terminals	IBM Personal Computer or any ASCII terminal	Any terminal	Any ASCII terminal
SEND FUNCTIONS				
Prompting	Standard	Standard	Optional	Standard
Editing	Standard	Standard	Standard	Optional
Go On	Standard	None	Standard	None
Help Facility	None	Standard	Standard	Standard
Append	Standard	Standard	Optional	Optional
Withdraw	Not at present (planned)	None	None	None
Message Length Restriction	None	None	5,000 words	10,000 char.
Trash	Standard	Standard	Standard	Standard
Distribution	Individ., groups, local and remote dist. lists, mailroom	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self
Store & Forward	Standard	Standard	Standard	Optional
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Not at present (planned)	Standard	Standard	Standard
Registered Messages	Standard	Standard	None	Standard
Acknowledges Msg. Receipt	Standard	Standard	None	Standard
Message Status	Sender, level, subject, time	None	Message header only	Message header only
FILE FUNCTIONS				
Filing	System, user, subject	Standard	System, user	System, user
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. time period	Standard	Automatic periodic purging	For indef. time period
Text Retrieval	Key word in subject, subject, author, date	—	Subject category	Key word, subject category, date
Tickler File	Time Management Facility	None	None	Standard
Electronic Wastebasket	Standard	Standard	Standard	None
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Available	Standard	Standard	Standard
Security	Password[1]	Password	Password	Password
Management Tracking	Standard	Standard	Standard	Standard
Customization of Options	Standard	Available	Available	Not available
Ability to Access Outside Ser.	Standard	Standard	Standard	None[1]
Outside Services Accessed	Selected gateways	Envoy 100, Telex	Telex I, Telex II	Not applicable
DATE OF INTRODUCTION	1985	November 1985	1977	1981
PRICING				
Purchase/Lease	$400/init.lic.fee 6/10 $585/$400 init.lic.fee[2] $1070/$805 init.lic.fee[3]	By quotation.	Not applicable	$4,500 (1st CPU), $2,700 (each add. CPU)[2]
Subscription	Not applicable	$50 one-time fee plus $.30/kilocharacter; $20/mo. org. fee[1]	$5/mailbox; $.20/min. connect time & delivery charges.	Not applicable
REMARKS & OTHER FEATURES	Send and receive any document/file format. [1]Can include encryption and private mailboxes. [2]Primary system/secondary system (6/20-6/42 and 6/70). + annual supp. & lic. fees. [3]Primary system/secondary system (6/45-6/98). + ann. sup. & lic. fees.	PC file transfer, error-free trans. [1]$3/mo. mailbox.	—	[1]This feature will be available soon. [2]Maint. fees- $540/yr. (1st CPU), $320/yr. (each add. CPU).

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All About Electronic Mail

COMPANY	Infomedia Corporation	Interactive Systems, Incorporated	Interlink Business and Comm. Serv. (IBCS)	International Business Machines
PRODUCT NAME	Notepad Computer Conferencing	EZMAIL®	IBENET	IBM Professional Office System (PROFS PP)
TYPE	In-house system & remote computing service	In-house system & remote computing service	Remote computing service	In-house system
HARDWARE				
Computer(s)	DEC 20 (w/TOPS operating system)	Tandem Non-Stop 2, TXP, EXT	Not applicable	IBM 370/138 or larger, 3031 or larger, 3081, 4331 or larger
Memory Requirements	87KB	At least 2MB (NS-1), 4MB (NS-2 or TXP)	Not applicable	1MB
Terminal(s)	Any ASCII terminal	Any terminal or PC	Any terminal or personal computer	IBM 3270, 3275 Mdl. 2, 3276 Mdl. 3, 3277 Mdl. 2, 3278 Mdl. 2, 3 & 4 3279 Mdl. 2A,3A,2B,3B[1]
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	—	Limited
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	Standard	Standard	None
Message Length Restriction	None	Unlimited	None	—
Trash	Standard	Standard	—	Standard
Distribution	To indiv., groups, self	To indiv., groups, self, persons not on system	To indiv., self, public network destinations	To individuals, groups, nested groups.
Store & Forward	Standard	Standard	Standard[1]	—
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	—	—
Registered Messages	Standard	Standard	None	None
Acknowledges Msg. Receipt	Standard	Stndrd. for reg. mail	Standard	Standard
Message Status	Message header only	Message header only	Message header	Message header only
FILE FUNCTIONS				
Filing	System	System, user	—	System, user
Directory	Standard	Standard	—	Standard
Message Storage	For indef. time period	For indef. time period, auto. periodic purging[1]	—	Notes indef. period of time in users folders.
Text Retrieval	Full search, subject category, date, time, keyword or phrase, context.	Subject category, date range, courtesy copy	—	Key word, subject category, author, date, recipient
Tickler File	Standard	Standard	—	Standard
Electronic Wastebasket	Standard	Standard	—	—
MISCELLANEOUS				
Directory of Users	Standard	Standard	—	Standard name file
Automatic Log Off	Standard	Standard	Standard	—
Security	Password, encryption, database controlled	Password, encryption	Password, user ID, answerback verification	Database controlled, encryption (opt.)
Management Tracking	Standard	Standard	Standard	—
Customization of Options	Available	Available	Available	Available
Ability to Access Outside Ser.	Standard	Standard	Standard	None
Outside Services Accessed	Telex I, add. progs. & database retrieval	Telex, MCI Mail, other[2]	Worldwide telex, telephone, X.25 public and private[2]	Not applicable
DATE OF INTRODUCTION	1975[1]	1981	November 1985	1983
PRICING				
Purchase/Lease	$40,000	Beginning at $20,000 plus mo. license/maintenance fee	Not applicable	Contact vendor for pricing[2]
Subscription	$1.10/min. includes Tymnet.	$5/hour plus Uninet connection charges	$50/mo./mailbox;$1.80/hr.connect charge; 6¢ per 1,000 char. pickup[3]	Not applicable
REMARKS & OTHER FEATURES	Document & file transfer functions. [1]Third version of product introduced in 1984.	Almost unlimited expansion up to 16 CPUs. Msg. can be sent to non-users, bul. brd., specified future date & time. [1]Private & chronological files respectively. [2]Any sys. supporting CCITT-EMS standard.	[1]Also supports interactive, conversational-type communications. [2]Plus remote database services. [3]80¢ per 1,000 characters/Intercontinental.	[1]Displaywriter & PC. [2]Quantity discounts & 60-day test allowances available.

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All About Electronic Mail

COMPANY	International Business Machines	ITT Dialcom, Incorporated	MCI	Microcom, Inc.
PRODUCT NAME	Distributed Office Support System (DISOSS)	Dialcom	MCI Mail	PCS/2000
TYPE	In-house system (Version 3)	Remote computing service	Remote computing service and packet switching network	In-house system & remote computing service
HARDWARE				
Computer(s)	IBM 370/138, 3031,3081, 4331 or larger.	Prime "50 Series" mini computers	Any PC, word processor, electronic typewriter	Any async RS-232 compatible computer
Memory Requirements	1.2MB plus CICS	—	—	None
Terminal(s)	Displaywriter PC via 8100 or 5520, 5253, 8775 3732, 3290, 317X, 327X, 3180, Scanmaster.	Any ASCII-based PC, word processor, terminal	Any data terminal	Any async terminal
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	Standard	Standard
Help Facility	Standard	Standard	Standard	None
Append	Standard	Standard	Standard	Standard
Withdraw	Admin. Service Aid	Standard	Standard	Standard
Message Length Restriction	None for documents, 250 chars. appended msgs.	132K ASCII; 62K binary	Unlimited	None
Trash	Standard	Standard	Standard	Standard
Distribution	To individuals, groups, self, persons not on system.	To indiv., groups, self	To indiv., groups, self	To individuals
Store & Forward	—	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	Standard
Registered Messages	C.O.D. only by request.	Standard	Standard	Standard
Acknowledges Msg. Receipt	C.O.D. only by request.	Standard	Standard	Standard
Message Status	Message Header	Message header only, urgency.	Msg. hdr. only, privacy level, urgency.	Standard
FILE FUNCTIONS				
Filing	System, user	User	24 hours (Basic Serv.)[1]	Standard
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. period, opt. purge by Admin. Aid.	For indef. time period	Auto. purge, 5-day inbox, outbox, desk.	For indef. time period
Text Retrieval	On date range, doc. type, subject.	Key word, subj. catgry. access, msg. addressee, date	Key word, full search, access by subject category.	File name
Tickler File	Standard	Standard	Standard	Optional
Electronic Wastebasket	Yes, if to temp. file.	Standard	Standard	None
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	None
Automatic Log Off	Optional	Standard	Standard	None
Security	Passw., database cntrl., ac. codes, encr.(opt.)	Password, encryption, database controlled.	Password, encryption	Password
Management Tracking	Data available	Standard	Standard	Standard
Customization of Options	Available	Available	Available	Not available
Ability to Access Outside Ser.	None	Standard	Optional	Standard
Outside Services Accessed	Not applicable	Telex I/II, online databases, gateways to other computer services	Telex I, Telex II	Any public dial-up system
DATE OF INTRODUCTION	1982	1978	September 1983	1983
PRICING				
Purchase/Lease	MVS-$4,570 initial lic. fee & $1,435/mo. rental charge.[1]	—	$18 per year mailbox fee. No registration fees or connect time.	$1,195
Subscription	Not applicable	$15.50 to $19/hr.(prime hours), $10.50/hr.(non-prime hours), 300 bps	Free	Not applicable
REMARKS & OTHER FEATURES	[1]VSE-$1,710 initial lic. fee & $570/month rental charge. DISOSS Profess. Support allows calendaring functions & has 1-time single charge of $5,700 for MVS & $3,100 for VSE. Quantity discounts & 60-day test allowances available.	Reponse time for max. no. of users is 5 to 10 seconds. Number of installed users totals 60,000.	4 hour, overnight, U.S. mail. Hard copy time-sensitive paper delivery. Max. no. simultaneous users is 200,000. Response time is instantaneous. [1]5-day store on disk (Advanced Service).	Error correcting, auto-dial/auto-answer and unattended msg. and file transfer are available.

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All About Electronic Mail

COMPANY	Mohawk Data Sciences	Network Technologies International, Inc.	On-Line Software International	Proprietary Computer Systems (P.C.S.)
PRODUCT NAME	Worldwide Integrated Communications (Winc)	PARTICIPATE	BULLETIN[1]	Electronic Mail
TYPE	Remote computing service	In-house system or remote computing service	In-house system	Remote computing service
HARDWARE				
Computer(s)	Not applicable	Prime Series 50, IBM, DEC-VAX	IBM 360/370, 303X, 308X, 43XX & compat.; CICS/VS, BTAM, VTAM	—
Memory Requirements	Not applicable	1MB	—	—
Terminal(s)	MDS terminals or any communicating terminal	Any ASCII terminal, IBM 3270s.	IBM 3270 or equiv., teletypewriters, IBM PC, PC/XT, PC/AT emulating 3270 terminals[2]	Any async terminal
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	Standard	Standard
Help Facility	Optional	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	Standard	Standard	None
Message Length Restriction	None (35,000 char. recommended)	None	Document oriented	None
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self, conferences	To individuals, groups, self	To indiv., groups, self
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	None
Registered Messages	Standard	Standard	Standard	Standard
Acknowledges Msg. Receipt	Standard	Only if sent registered	Standard	—
Message Status	Message header only	Urgency, cnfrnce name, msg. hdr., privacy.	Standard	Originator, date/time, subject, priv. level
FILE FUNCTIONS				
Filing	System[1]	System, user	System, user	Standard (system & user)
Directory	Optional	Standard	Standard	Standard
Message Storage	Automatic periodic purging	For indef. time period, sys. & user purging opt.	User-defined with user-specified archiving	For indefinite time period
Text Retrieval	Filing reference number	Keyword, subject category, date, time, author	Document name, from/to, subject, plus 2 additional user-defined criteria	Keyword, full search, originator, date sent, recipient
Tickler File	Optional	Standard	None	Standard
Electronic Wastebasket	Standard	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Optional	Standard	None	None
Security	Password	Password, encryption, database controlled	Password, confidential	Password, encryption
Management Tracking	Standard	Standard	Standard	None
Customization of Options	Available	Available	Available	Available
Ability to Access Outside Ser.	Standard	None	Standard	—
Outside Services Accessed	Telex I, Telex II, Int'l, Winc Service, IRC, British Telecom.	Access through teleprocessor-based systems	PROFS, PC, and bulletin-to-bulletin	—
DATE OF INTRODUCTION	1980	1982	1986	
PRICING				
Purchase/Lease	Not applicable	$6,000 to $25,000 [1] University and quantity discounts available	$18,000 to $25,000 includes supervisory training	Not applicable
Subscription	$20 to $200/per terminal per mo. plus usage	$7.75 to $30.00/hr. Source or other	Not applicable	Contact vendor for pricing
REMARKS & OTHER FEATURES	[1]Filing also possible on Series 21 terminal.	Integrated pkg.—Elec. mail/Comp. confrncng./Bul. brd. [1]Training & consulting available.	Auto delivery, calendaring, scheduling, and forms capability. Applications program interface. [1]Product formerly marketed as OMNILINK. [2]IBM 3280 printers or equivalent.	—

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All About Electronic Mail

COMPANY	Soft-Switch, Incorporated	Soft-Switch, Incorporated	SofTest, Inc.	Software Connections, Incorporated
PRODUCT NAME	PC/TSO Mail	PC/VM Mail	SofGram	LAN: Mail Monitor
TYPE	In-house system	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	IBM S/370 and compatibles (TSO and MVS or MVS/XA)	IBM S/370 and compatibles (CMS and VM)	Any system using UNIX or UNIX look-alike oper. sys.	IBM Personal Computers, TI Professional, HP-150
Memory Requirements	2MB/active user plus 4MB server	1MB/active user plus 4MB server	256KB	256K
Terminal(s)	3270-type (including TTY through emulation) and personal computers	3270-type, TTY, and personal computers	Any ASCII terminal	—
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	—	Standard	Standard
Go On	Standard	—	Standard	None
Help Facility	Standard	Standard	Standard	Standard
Append	—	—	Standard	Standard
Withdraw	—	—	None	None
Message Length Restriction	None	None	None	60 lines
Trash	Standard	Standard	Standard	None
Distribution	To indiv.,nicknames, group(s), self; transparently to other users[1]	To Indiv., nicknames, group(s), self; transparently to other users[1]	To indiv., groups, self	To indiv., groups, self
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	—	Standard	Standard
Registered Messages	Standard	—	None	Standard
Acknowledges Msg. Receipt	Standard	—	Only if sent registered	Standard
Message Status	Standard	—	Privacy level,[1] urgency	Message header only
FILE FUNCTIONS				
Filing	Standard	Standard	System, user[2]	System, user
Directory	Standard	Standard	Standard	None
Message Storage	For indefinite time period	For indefinite time period	For indef. time period	For indef. time period
Text Retrieval	—	Author, subject, date, keyword	Subject category, recipient	Subject, date
Tickler File	—	—	Standard	None
Electronic Wastebasket	—	—	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Standard	—	None	None
Security	Standard	Standard	Password, UNIX file permissions	Password
Management Tracking	User exit, log	User exit	Standard	None
Customization of Options	—	—	Available	Not available
Ability to Access Outside Ser.	Optional	Optional	Standard	None
Outside Services Accessed	MCI Mail	MCI Mail	Telex I, Telex II, others such as mailgram, cablegram, WU's FYI	Not available
DATE OF INTRODUCTION	November 1984	February 1984	November 1983	1982
PRICING				
Purchase/Lease	$43,000 and up	$43,000 and up	$500 to $2,500, quantity discounts available	$995—standard local area network version[1]
Subscription	Not applicable	Not applicable	Not applicable	Not applicable
REMARKS & OTHER FEATURES	Revisable text translation avail. Integrated PC support. Transparent conn. to other internal & external mail and office systems. [1]Sys./36, 5520, DISOSS, PROFS, ALL-IN-ONE, VMSmail, MCI Mail, Wang Office, IBM Displaywriter,NBI,Wang,Xerox.	Revisable text translation avail. Integrated PC support. Transparent conn. to other internal & external mail & office systems. [1]All-In-One, VMSmail, MCI Mail, Wang Office, Wang Mailway, IBM Displaywriter, NBI, Wang, and Xerox.	[1]Privacy levels of sender's files, not recipient's. [2]Also chronological filing and any user-specified scheme.	[1]Includes modem support for network-to-network or single station to network mail. $250 single user/remote option.

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All About Electronic Mail

COMPANY	Source Telecomputing Corporation	Systar Corporation	Telecom Canada Telephone System	Telenet Communications Corporation
PRODUCT NAME	The Source (Source Mail)	ELF System	Envoy 100	Telemail Service
TYPE	Remote computing service	In-house system	Remote computing service	In-house system & remote computing service
HARDWARE				
Computer(s)	Compatible with all standard micros	IBM Series/1	Not applicable	Tandem Non-Stop 2, Tandem Non-Stop TXP.
Memory Requirements	Not applicable	256KB	Not applicable	Not applicable
Terminal(s)	Any ASCII terminal	TTY, personal computers, word processors, async terminals & printers	ASCII (110 to 1200 bps), IBM 3270 or emulating terminals, 3780, personal comps, word proc.	Async TTY terminals including word processors & smart devices
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	None	Standard	Standard	Standard
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	Standard	None	Standard	None
Message Length Restriction	None	None	550,000 char.	None
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self	To indiv., groups, self, persons not on sys., Telex worldwide	To indiv., groups, self
Store & Forward	Standard	Standard	Standard	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard (automatic)	Standard
Scan Mailbox/Status of Previously Sent Messages	Not available	Standard	Standard	None
Registered Messages	Standard	Standard	Standard	Standard
Acknowledges Msg. Receipt	Standard	Standard	Standard	Only if sent registered
Message Status	Privacy level, urgency, message header.	Message header, urgency, privacy level	Privacy, urgency, msg. header	Message header, privacy level, urgency
FILE FUNCTIONS				
Filing	System, user	System, user	System, user	System, user
Directory	Optional	Optional	Standard	Standard
Message Storage	For indef. time period, auto periodic purging	For indef. time period, auto. periodic purging	For an indefinite time period[1]	For indef. time period
Text Retrieval	Subject category	Full search, message number	Subject category, date, name, sender	Subject category, author, date
Tickler File	Optional	None	None	Standard
Electronic Wastebasket	Standard	Standard	Standard	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Standard	Standard	Optional	Standard
Security	Password	Password	Password, private I.D.	Password
Management Tracking	Optional	Standard	Standard	Standard
Customization of Options	Not available	Available	Available	Available
Ability to Access Outside Ser.	None	Standard	Standard	Standard
Outside Services Accessed	None	Telex I, Telex II, X.25 Networks, WATS, ROLM, CBX, RCA & others	Telex I, Telex II, Datapac	Telex I, Telex II, other CBM systems
DATE OF INTRODUCTION	1979	1981	1981	1980
PRICING				
Purchase/Lease	$49.95 per mailbox	$19,500 & Series/I	Not applicable	Contact vendor
Subscription	$.36/min. weekdays; $.14/min. weekends[1]	Not applicable	Contact vendor for pricing	$140/mo. plus usage ($500 monthly usage min. after 90 days)
REMARKS & OTHER FEATURES	Other communications features: MAILGRAM, computer conferencing, bulletin boards, interactive communications. [1]Registration fee-$49.95.	ELF System can be combined w/other Systar products incl. protocol conv. for emulation of 3270 & 5251 type term. for access to host comp. sys. PC ELF avail. to prepare msg. off-line & execute it w/1 keystroke.	In the U.S., Envoy 100 can be accessed from the Telenet or Tymnet packet switched networks. Fr. or Eng. lang. choice, elec. forms capability.[1] Can profile user for auto. purging after given period.	Forms creation capability; hardcopy delivery; PC Telemail available; Telex interface.

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All About Electronic Mail

COMPANY	Top Down Systems	Tymshare, Incorporated	Unisys Corporation	Wang Laboratories, Incorporated
PRODUCT NAME	Qwik-Mail[1]	OnTyme II	Office Mgmt. System II EM Module	Wang Office
TYPE	In-house system	Remote computing service	In-house system	In-house system
HARDWARE				
Computer(s)	IBM 370 and plug compatible mainframe architecture	Not applicable	B1900, B3/4000, B5/6/7000, V-Series, A-Series	Wang VS, PC, OIS, Alliance
Memory Requirements	256KB+ 10KB per user	Not applicable	Varies w/size of system	2MB (VS); 384KB (PC); 64KB (OIS, Alliance)
Terminal(s)	IBM 3270 and TTY compatible terminals, VTAM	Any ASCII terminal, personal computers, word processors, Telex, TWX.	BurroughsMT985,ET1100, ET2000, B20, B25, OFISwriter 400	Any Wang workstation, Wang PC, IBM PC, and async terminal
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Standard	Standard
Go On	Standard	Standard	—	Standard
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	—	Standard
Withdraw	None	Standard	Standard	None
Message Length Restriction	32,767 lines	None	Document oriented	31,680 (messages); none for doc. or data files
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self	To indiv., groups, self, Telex or TWX user	To indiv., groups, self	Indiv., groups, self, other lists, traveling user's mailbox[1]
Store & Forward	Standard	Standard	—	Standard
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	—	Standard
Registered Messages	Under development	Standard	Standard	Standard
Acknowledges Msg. Receipt	Under development	Standard	Standard	Standard
Message Status	36 prior. levels, date (sort/send.,prior.,date)	Message header	Standard	Msg. hdr., author, date, time, priority[2]
FILE FUNCTIONS				
Filing	User	System, user	System, user	Standard
Directory	Standard	Standard	Standard	Standard
Message Storage	For indef. time period auto. periodic purging[2]	For indef. time period opt. auto. per. purging	For indef. time period	For indef. time period or user-defined period
Text Retrieval	36 priority levels, creation and tickle date, author	Key word	—	Title, author, date, keyword, words-in-text, Booleans, library
Tickler File	Standard	None	—	Standard
Electronic Wastebasket	Standard	None	—	Standard
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	Standard
Automatic Log Off	Not applicable	Standard	—	Standard
Security	Password, user defines acceptable senders	Password, multiple levels user-controlled	Password	Password, mult. levels, priv. ID, shared lists
Management Tracking	Standard	Standard	—	Standard
Customization of Options	Available	Available	—	Standard
Ability to Access Outside Ser.	Standard	Available	—	Optional
Outside Services Accessed	Any service compatible with CPU or TTY	Telex I, Telex II	—	DISOSS, PROFS
DATE OF INTRODUCTION	1983	1981	March 1985	1984
PRICING				
Purchase/Lease	$4,000; $254/mo. rent; $139/mo. 3-yr.; $111/mo. 4-yr.[3]	By quotation	$8,500 to $10,000	—
Subscription	Not applicable	$200/mo. per organization plus usage & connect time	Not applicable	—
REMARKS & OTHER FEATURES	[1]Qwik-Mail is an option of Qwik-Draft III Mainframe word processing system, which is req. [2]Purge time and expiration dates may be specified. [3]$95/mo.-5 yr. leases. Plus Qwik-Draft III.	Prompting Exec command can now permit tailored question/answer routines for formatted messages or access to filed information.	—	Invitations, folders, subroutine interface to messaging + calendar, phone messages, text-to-speech, multiple network types. [1]Organizations and nested lists [2]Type, Read/Not Read

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All About Electronic Mail

COMPANY	The Western Union Telegraph Company	Westinghouse Electric Corporation	Wizard Computer Products	Wizard Computer Products
PRODUCT NAME	EasyLink Instant Mail Service	MailTronic	Wizard Mail	Wizard Link
TYPE	Remote computing service	In-house system	In-house system	In-house system
HARDWARE				
Computer(s)	Not applicable	IBM DOS VSE w/ WESTI or CICS software	IBM 370, 30XX, 43XX	IBM 370, 30XX, 43XX
Memory Requirements	Not applicable	20KB	40K	40K
Terminal(s)	Most sync terminals and sync systems[1]	IBM 3270 Series	IBM 3270 or compatible, including PCs	IBM 3270 or compatible, including PCs
SEND FUNCTIONS				
Prompting	Standard	Standard	Standard	Standard
Editing	Standard	Standard	Limited	Limited
Go On	None	Standard	Standard	None
Help Facility	Standard	Standard	Standard	Standard
Append	Standard	Standard	Standard	Standard
Withdraw	None	Standard	None	None
Message Length Restriction	400,000 chars.	None	Max. of 1,386 70-char. lines	Max. of 1,386 70-char. lines
Trash	Standard	Standard	Standard	Standard
Distribution	To indiv., groups, self, persons not on system, Telex worldwide	To individuals, groups	Indiv., groups, self, persons on and not on system	Send msgs. thru EasyLink with Telex nos.,Easylink nos., & postal addresses
Store & Forward	Standard	Standard	Standard	None
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard	Standard	Standard	Standard
Scan Mailbox/Status of Previously Sent Messages	Standard	Standard	Standard	Standard
Registered Messages	Standard	None	Standard	Standard
Acknowledges Msg. Receipt	Standard	Standard	Standard (Regis. Mail)	Standard
Message Status	Sub. & origin., date, time, size, urgency	Msg. hdr., urgncy., usr. specified, priority lev.	Message header, urgency and privacy level	Message header, urgency and privacy level
FILE FUNCTIONS				
Filing	Unread,read,sent,chron.	System	System	System
Directory	Standard	Standard	Standard	Standard
Message Storage	3 to 5 days	For indef. time period, auto. periodic purging	For indef. time period	User specified time period
Text Retrieval	Scan, date/time, msg. number	None	Subject category, author	Subject category, author
Tickler File	None	Standard	Standard	None
Electronic Wastebasket	None	Standard	None	None
MISCELLANEOUS				
Directory of Users	Standard	Standard	Standard	None
Automatic Log Off	Standard	None	—	None
Security	Password	Password	CICS + must be defined Mail user[1]	CICS + must be defined as a Link user
Management Tracking	Available	None	Standard	Standard
Customization of Options	Available	Available	Available	Available
Ability to Access Outside Ser.	Standard	None	Available	Standard
Outside Services Accessed	Telex I, Telex II, Mailgram, Cablegram, Telegram, Comp. Ltr. Srvc.[2]	None	Wizard Link[2]	Western Union's EasyLink
DATE OF INTRODUCTION	1982	1983	1983	1986
PRICING				
Purchase/Lease	Not applicable	$12,000	$3,000 one-time charge for perpetual use license	$2,500 one-time charge for perpetual use license
Subscription	$25/yr. Elec. add. only; $25/mo. Telex No. and elec. add.	Not applicable	$350/yr. maintenance fee	—
REMARKS & OTHER FEATURES	24-hr./day cust.assist., Telex no. to receive Telex msgs., FYI News Serv., OAG Airlines sched., Fares & Reserv., On-Line Directories, InfoMaster to access 700 databases. [1] Most bisync, async, sync, mini & mainframes [2] DHL Courier Delivery	—	Wizard Talk, an available enhancement to Wizard Mail, provides voice output for mail messages-$7,000. [1] Security is OPID-oriented. [2] Add on feature provides gateway to Western Union Easylink-$2,500.	Wizard Link is a standalone system that provides a gateway into Western Union's Easy-Link system. It is also available with Wizard Mail.

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All About Electronic Mail

COMPANY	Xerox Corporation			
PRODUCT NAME	XNS Mail			
TYPE	In-house system			
HARDWARE				
Computer(s)	Xerox 8000 Network System processor			
Memory Requirements	384KB			
Terminal(s)	Xerox 8010 Star workstation, Xerox 820, 860, ASCII terminals			
SEND FUNCTIONS				
Prompting	Standard			
Editing	Standard			
Go On	Standard			
Help Facility	Standard			
Append	Standard			
Withdraw	None			
Message Length Restriction	8,000 bytes			
Trash	Standard			
Distribution	Standard			
Store & Forward	Standard			
RECEIVE FUNCTIONS				
Scan Mailbox/Incoming Msg.	Standard			
Scan Mailbox/Status of Previously Sent Messages	Standard			
Registered Messages	None			
Acknowledges Msg. Receipt	None			
Message Status	None			
FILE FUNCTIONS				
Filing	User			
Directory	Standard			
Message Storage	For indef. time period			
Text Retrieval	—			
Tickler File	None			
Electronic Wastebasket	Standard			
MISCELLANEOUS				
Directory of Users	Standard			
Automatic Log Off	None			
Security	Password			
Management Tracking	None			
Customization of Options	None			
Ability to Access Outside Ser.	None			
Outside Services Accessed	None			
DATE OF INTRODUCTION	1984			
PRICING				
Purchase/Lease	$850 per copy/software			
Subscription	Not applicable			
REMARKS & OTHER FEATURES	Integrated with Xerox Network System distributed series architecture.			

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